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NEWSPAPER

AT&T Gets OK To Go Global

WASHINGTON, D.C. — The Federal Communications Commission last week told five U.S. international record carriers that they can offer voice communications services between the U.S. and Britain. The action cleared the way for AT&T to offer international telex and data services.

Four of the five IRCs — TRT Telecommunications Corp., RCA Global Communications, Inc., ITT World Communications Corp. and FTC Communications, Inc. — had previously filed applications to offer private-line voice service to Britain. Those applications have now been granted.

MCI Communications Corp., which owns Western Union International, will announce a new international voice service this week.

Until now, AT&T has been the exclusive U.S. provider of international voice-only services, but was barred from offering digital data services internationally. The IRCs, meanwhile, have been allowed to offer alternate voice/data services.

Last week's decision permits AT&T to begin offering international telex and data services immediately over existing facilities, without getting FCC approval. The IRCs can also market international voice services immediately.

Any "enhanced" international services offered by AT&T — such as data processing or its recently announced Advanced Information Service/Net 1000 — must be offered through American Bell, Inc., the phone company's unregulated subsidiary.

Replaces B7800 Line

Burroughs Unveils Its Biggest CPU

By Susan Blakeney
CW Staff

DETROIT — Burroughs Corp. has unveiled its largest computer system to date — the B7900 — which reportedly boasts up to 16 times more memory than the firm's previous top-of-the-line processor. It is also said to offer significantly more processing capacity and require less power than other Burroughs computers.

The B7900 competes with high-end IBM systems such as the 3083 Model Group B, 3081 Model Groups D, G and K. It replaces Burroughs' former top-end machines, the B7800 line, which the firm will no longer manufacture.

In a concurrent announcement, Burroughs unveiled two large-capacity disk drives offering up to 542M bytes of storage in a single unit. Reportedly, these are the first to be developed by Burroughs' Memórex Corp. subsidiary for use on Burroughs mainframes (story on Page 8).

The newly introduced B7900 top-of-the-line computers offer up to 96M bytes of main memory; the B7800 had up to 6M bytes of memory. The B7900's memory and I/O band paths are also four times greater than those offered on the B7800. The B7900 features built-in expandability and reportedly requires 55% less power and air conditioning than previous Burroughs large-scale systems.

In addition, the B7900 occupies 50% less floor space than the B7800, a spokesman noted.

The B7900 system is primarily targeted for applications that involve processing large volumes of data at very high speeds, the Burroughs spokesman continued. Initially, it will be offered as three separate single- and multiprocessor families based on work load requirements. These systems include:

- The B7900F, a single processor with 12M bytes of memory.
- The B7900H, two processors and 24M bytes of memory.

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Thirteen Vendors Endorse IEEE Local-Net Standard

By Bruce Hoard
CW Staff

PALO ALTO, Calif. — Thirteen data communications and electronics companies have announced their support for a proposed local-area network standard developed by the IEEE 802 Local-Area Networks Standards Committee.

The proposed 802 standard describes the carrier-sense multiple access with collision detection line access scheme. The CSMA/CD document is one of three documents collectively known as "P 802.3," which recently were approved by the committee and passed on for approval by other IEEE members. The other two cover the token bus line access scheme and link-level protocols required for local-area network communications.

The 13 companies that announced their endorsements of the standard in a press release issued here last week were Bridge Communications, Inc., Data General Corp., Digital Equipment Corp., Fujitsu America, Inc., Hewlett-Packard Co., Intel Corp., Interlan, Inc., National Semiconductor Corp., Siemens AG, Tektronix, Inc., 3Com Corp., Ungermann-Bass, Inc. and Xerox Corp.

"The new IEEE P 802.3 draft standard [on CSMA/CD] represents convergence of the IEEE 802 working draft, [Xerox's] Ethernet specifica-

(Continued on Page 9)

The Party Season: Keeping It in Perspective

By Bob Johnson
CW New York Bureau

NEW YORK — 'Tis the season to lose output, cancel jobs mistakenly, allow unauthorized personnel into the computer room and crash systems.

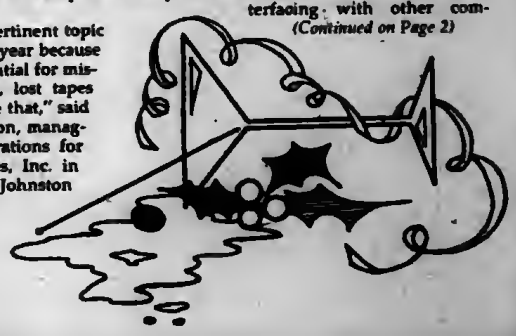
Although these and other DP disasters do not occur only around the holiday season, lax security measures and good spirits at this time of year do make DP operations particularly vulnerable to the situations of which nightmares are made.

What measures do computer operations executives take at this time of year to prevent major operational problems? And how do they strike the balance that prevents them from looking like scrooges while they maintain a secure shop at holiday time?

"This is a pertinent topic at this time of year because there is a potential for misplaced reports, lost tapes and things like that," said Dennis Johnston, manager of DP operations for Ebasco Services, Inc. in New York. Johnston said that he has seen situations in which a drink or two taken by an operator has caused a problem.

"Mental awareness" is the single most important thing both operations managers and operators must stress during this festive time in an effort to stymie careless work, Johnston said. "We don't install any additional security measures than are already prevalent throughout the rest of the year. However," he commented, "we make a point of keeping our eyes open for mistakes. Managers must be doubly aware of these problems and how their operators are interfacing with other com-

(Continued on Page 2)



Product Spotlight

Videotex/Teletext: Application?

By Phil Hirsch
CW Washington Bureau

Videotex/teletext appears to be a technology in search of an application. In fact, at least one critic, David Humphreys, contributing editor to *Computing Canada*, has openly referred to Telidon, one of the three videotex technologies now struggling for commercial viability, as "a government-supported boondoggle with its own vested interests and not much of a relationship to the marketplace."

The implementation of videotex/teletext technology in the U.S. is far behind the rest of the world. For example, Great Britain has Prestel, a network that can be accessed from the U.S. and several other countries. Prestel is the only videotex system that has an appreciable number of paying customers.

The British also operate Ceefax and Oracle, the two most popular teletext systems.

France will soon have a nationwide network linking several thousand users of electronic directory and closed user group services. The Canadians have a number of field trials under way.

However, all of these activities are heavily subsidized and probably do not reflect the real market.

In the U.S., a number of data bases can be accessed through videotex as well as conventional data terminals. Dow Jones & Co. is one of the infor-

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DPers Keeping Eye on Partying

(Continued from Page 1)

pany personnel. An operator could get to feeling that he knows more than he really does."

Dan Berard, computer services manager for Exxon Corp. in Houston, also takes no additional security measures during the holidays, but pointed out that his shop has an "elaborate" security scheme.

No On-Site Parties

"We don't have any on-site parties here, so we need not worry about our personnel getting out of hand. As far as unauthorized personnel goes, anyone going in or out has to have a badge," he said.

One solution to the party problem is to celebrate "off campus." That is what the computer operations staff does at New York's Financial Information Services Agency (Fisa). Alfonso J. Izzi, Fisa's executive director, said that by holding parties off premises, operations management does not have to worry about people walking around with drinks in their hands.

Fisa beefs up its security patrol as the holidays approach and arranges work schedules so that employees have an opportunity to do what they have to for the holidays and do not leave the computer room stranded.

"We will bring our systems down on the Christmas weekend as a precautionary measure as well. Fortunately, we have a situation where we can let people celebrate to a degree without problems," Izzi said.

The Problems: Too Many Errors, Too Much Absenteeism and Booze

ANAHEIM, Calif. — The three biggest problems that occur during the holidays are higher than normal error rates, increased absenteeism and the consumption of alcoholic beverages, according to Len Eckhaus, president of the Association for Computer Operations Managers. Eckhaus noted, however, that operations managers can take specific actions to prevent problems.

"As far as errors go, emphasize quality control," Eckhaus advised. "The holiday mood makes people careless. For example, double-verify your dats entry work and have all output data double-checked by output control."

No shift schedule variations that leave only a single operator available should be allowed, nor should the shift supervisor and lead operator be off at the same time, Eckhaus said.

One way to discourage excessive absenteeism is not to pay people if they do not report for work the day before or the day after a holiday. This may not be a popular practice, but it is effective, according to Eckhaus.

He also cautioned against serving hard liquor at computer installation parties and advised against lunchtime parties.

Corrections

In "Do Spreadsheets Mean Micros?" [CW, Dec. 6], the address for Parallax Systems, Inc. was omitted. The Execucalc vendor is located at 331 W. 71st St., New York, N.Y. 10023.

In an article spotlighting the Computer Division at the benefits consulting firm of Woodward, Ryan, Sharp & Davis, Inc. [CW, Nov. 8] the Aces software system was misidentified. The correct name of the system is the Automatic Claims Entry System.

In "Western Union Proposes Rate Hikes Up to 54%" [CW, Nov. 1], it was erroneously reported that Western Union had proposed increases of up to 54% for its telex and TWX services. This is actually the maximum for the company's Low-Speed Private Line Service. Telex and Telex II (TWX) charges would increase a maximum of 9.6%.

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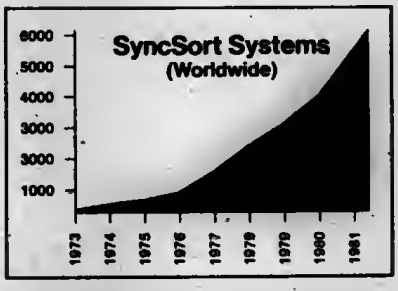

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Formal Planning Groups Missing

Survey: MVS Users Without PM, CP Planning

By Lois Paul
CW Staff

VIENNA, Va. — A majority of the 150 organizations responding to Morino Associates, Inc.'s MVS Worldwide Performance Management and Capacity Planning Survey do not have either formal performance management or capacity planning organizations.

That is one finding in a preliminary report on the survey, which was launched last May to gather information about how performance management and capacity management issues are being addressed by the MVS community.

Only 33% of the 150 respondents said they have a formal performance management organization and only 40% have a formal capacity planning organization. In both cases, these organizations report to a person at the manager level.

The respondents who reported an absence of formal performance management and capacity management organizations said that work is done by systems programming staffs.

Survey respondents were given a list of 53 performance management and capacity management tools and facilities and asked to indicate the ones that they use. For performance management, 85% said they primarily use IBM's Resource Management Facility (RMF) and 74% said they primarily use IBM's System Management Facility (SMF).

Under performance management products for secondary use, IBM's Generalized Trace Facility was listed by 54% of the survey respondents.

IBM's RMF and SMF also ranked highest in usage (by 65% and 64% respectively) of capacity planning tools for primary use, followed by SAS Institute, Inc.'a SAS (57%). For secondary use under capacity planning, 15% of the respondents named IBM's Snapshot (Figures 1 and 2).

Asked to indicate which of 14 listed actions were taken during the past year to improve performance and increase capacity, the majority of the respondents said they added direct-access storage devices. The second most frequent action taken for performance management was upgrading operating systems.

Adding main storage and upgrading operating systems tied for second place under capacity management improvement.

The most significant problems encountered in the areas of performance management and capacity management? Getting budget approval for tools, staff and education, according to the majority of the 150 respondents.

Next in line was finding staff, followed by inadequate facilities and the failure of performance management and capacity planning to be recognized as a requirement.

Survey respondents were also asked to rate the benefits that a list of eight changes to installations would provide in performance management and capacity planning. The changes included system tuning, MVS system control programming upgrade, application tuning, purchase of system software, purchase of applications software, Performance program temporary fix, Share/Guide modifications and in-house modifications.

None of the respondents indicated that they had attempted to employ every source of improvement or course of action. However, 79% (117 of 150) had tried system tuning. Of these, 47% reported some benefits to performance management and 53% reported substantial benefits. The surveyers developed a gross ranking chart in which they weighted the relative "benefits" reported for each course of action (Figure 3).

The majority of the 150 organizations responding to Morino's survey (91%) said they identify performance management-related problems by periodically reviewing key performance indices. Sixty-three percent respond to performance problems as they occur without standard procedures for problem identification, tracking or resolution; and 51% utilize on-site vendor support to aid in problem identification and resolution.

Seventy-five percent of the 150 installations said they solicit information from applications and user groups to include in their capacity plans, 70% concentrate capacity management on the periodic production of an "installation plan" supplemented by special studies when problems arise, 63% utilize vendor assistance in their capacity management process and 42% have standard procedures for the ongoing tracking and verification of existing capacity plans.

Ninety percent of the responding organizations indicated they produced one or more performance management reports, and 74% said they produced capacity management reports.

In the final report on this survey, scheduled for release during the first quarter of 1983, Morino plans to provide responses in tabular or graphics form.

Further information about the survey effort can be obtained from Morino Associates at Suite 602, 8133 Leesburg Pike, Vienna, Va. 22180.

TOOLS AND DATA SOURCES USED FOR PERFORMANCE MANAGEMENT — PRIMARY USE

Vendor	Product	% of 150 Responses
IBM	RMF	85
IBM	SMF	74
SAS Institute	SAS	51
Candle Corp.	Omegamon	45
Morino Associates, Inc.	TSO/MON	30
IBM	CICS/VS Performance Analyzer	26
Candle Corp.	Dexan	22
Candle Corp.	Omegamon/CICS	22
Morino Associates, Inc.	Mics	21
IBM	GTF	20
IBM	Pars Family	18
IBM	NPA — Host	17
IBM	IMS Log	16
Boole & Babbage, Inc.	CMF	14
Boole & Babbage, Inc.	Resolve	13
IBM	IMS (DC) Monitor	13
Applied Data Research, Inc.	Look	12

Source: Morino Associates

Figure 1

TOOLS AND DATA SOURCES USED FOR CAPACITY PLANNING — PRIMARY USE

Vendor	Product	% of 150 Responses
IBM	RMF	65
IBM	SMF	64
SAS Institute	SAS	57
BGS Systems, Inc.	Best/1	22
Morino Associates, Inc.	Mics	18
Morino Associates, Inc.	TSO/MON	17
BGS Systems, Inc.	Capture/MVS	14
IBM	CICS/VS Performance Analyzer	13
IBM	IMS Log	10

Source: Morino Associates

Figure 2

PERFORMANCE MANAGEMENT BENEFITS

	Rating	Total Responses
System Tuning	153	117
Applications Tuning	113	89
Purchase Software System	104	82
MVS SCP Upgrade	101	101
Performance PTFs	88	72
Share/Guide Mods	51	80
In-House Mods	35	55
Purchase Application Software	(14)	56

Source: Morino Associates

Figure 3

Meet on Disks Set in February

WINTER PARK, Fla. — The Institute for Graphic Communication, Inc. will sponsor a small group conference, "Outlook for Optical and Video Disk Systems and Applications," at the Langford Resort Hotel here Feb. 20-22.

The conference will focus on emerging technologies and applications and how they apply to various areas such as the government, education, training, data base functions, merchandising and data storage and retrieval. Special attention will be given to interactive videodisk techniques and developments as well as computer optical disks.

The conference costs $595; $695 with lodging. More information is available from the Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

Software AG Users to Convene June 5-9

RESTON, Va. — Software AG of North America, Inc. will hold its 12th Annual International Users' Conference June 5-9 in New Orleans.

The conference will feature guest speakers, user presentations, workshops and tutorials designed for all levels of the company's product users. It also will include product change/enhancement sessions and presentations on product status and future goals.

The keynote speaker will be Charles P. Lecht, chairman of Lecht Sciences, Inc., a New York-based "think tank" specializing in computer and communications systems technologies and author of *The Waves of Change — a Techno-Economic Analysis of the Data Processing Industry*. He will discuss future trends in hardware and software in "The Technology Vector" at the conference.

Other scheduled speakers are Ronald Ross, editor of the "Data Base Newsletter"; Ulric Weil, principal in DP at Morgan Stanley, Inc. and author of *Information Systems in the '80s*; and William Perry, executive director of the Quality Assurance Institute.

The conference will be held at the New Orleans Fairmont and Royal Sonesta Hotels and will feature a companion program for spouses and an optional post-conference trip to Cancun, Mexico.

Further information about registration can be obtained from Software AG of North America, Inc., 11800 Sunrise Valley Drive, Reston, Va. 22091.

Get with the program!

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BRINGING PEOPLE INTO THE PROGRAM

Relational Data Base Unit Highlights Product Debuts At Dexpo West '82 Show

By Jeffry Beeler
CW West Coast Bureau

ANAHEIM, Calif. — Britton-Lee, Inc.'s introduction of its latest relational data base machine highlighted last week's Dexpo West '82 show, which show organizers said drew the largest gathering of Digital Equipment Corp.-compatible product vendors ever assembled under one roof.

Britton-Lee's latest machine, a back-end processor known as the IDM 500/2, is geared primarily for data base management applications involving 400 to 4,000 users and data bases holding as much as 10G bytes, a company spokesman said. It reportedly executes 10 million data base instruction/sec, more than five times the speed of DEC's VAX-11/780 and twice as fast as any of Britton-Lee's previous products.

An optional facilities software package allows the processor to operate with any VAX-11 or PDP-11 series machine running either the VMS or Bell Laboratories' Unix operating system.

Prices for the IDM 500/2 start at $85,000, with first customer shipments scheduled for next month, a spokesman said. Britton-Lee can be reached at 90 Albright Way, Los Gatos, Calif. 95030.

Another Processor

Also introduced at Dexpo West '82 was a second processor, the Spectrum Eleven GT desktop minicomputer, this one from Webster Electronics, Inc. Built around a DEC LSI-11/23, the mini reportedly features a 30M-byte Winchester disk unit with a removable cartridge tape module for backup.

The Spectrum Eleven GT transfers 1M byte/sec and requires at least 64K bytes of main memory, expandable to 1M byte. Prices for the machine begin at $14,600.

Webster also selected Dexpo West '82 as the springboard from which to launch two other products — the Model ST97 CRT terminal, said to provide compatibility with the DEC VT100, and the Spectrum Eleven SZV11, an eight-line multiplexer that offers twice the functionality of DEC's DZV11 but occupies half the space, a spokesman said.

The ST97 and Spectrum Eleven SZV11 cost $995 and $1,150, respectively, and are available from Webster at Suite 106, 333 Cobalt Way, Sunnyvale, Calif. 94086.

In other hardware-related product developments, Sky Computers, Inc. last week formally released a 512-byte dual-port memory for DEC's LSI-11 series of microprocessors. The product can serve either as a common memory system in multiprocessor environments or as a special high-speed storage unit for direct-memory access I/O modules, the company said.

Priced at $4,500, the memory can be obtained from Sky Computers at Foot of John St., Lowell, Mass. 01852.

Local Networking System

On the data communications front, Standard Engineering Corp. announced the availability of a local networking system that reportedly allows up to 255 processors or programs as far as several miles apart to intercommunicate at 1M bit/sec.

Unlike other local networking aids for the PDP-11 and LSI-11 product families, Partyline offers front-end intelligence, networking software, program-to-program communications and an error-recovery capability, a company spokesman said.

Partyline costs $2,995 and can be delivered in 30 to 45 days from Standard Engineering at 44800 Industrial Drive, Fremont, Calif. 94538.

Dexpo West '82 also triggered a rash of announcements of previously unavailable software. One such product is Smartform, a data management tool from Signal Technology, Inc. Intended for VAX-11 processors running under VMS, the package allows users to create interactively screen forms on a DEC VT100 and then do DP tasks without host language interface programming, a company source said.

Smartform currently is available for the introductory price of $5,000 and can be obtained from Signal Technology at 5951 Encina Road, Goleta, Calif. 93117.

Pascal-Plus Debuts

A second software package to make its debut at the Dexpo show was National Information Systems, Inc.'s Pascal-Plus, a production-oriented compiler for Decsystem-10 and Decsystem-20 users. Pascal-Plus boasts programming features typically found only in languages like Ada, Fortran and Algol and produces 30% to 40% more compact code than most standard compilers, a company spokesman said.

The compiler sells for $25,000 and is available from its developer at Suite 245, 20370 Town Center Lane, Cupertino, Calif. 95014.

Some other software products whose introductions were timed to coincide with Dexpo West included:

- Digital Information Systems Corp.'s DBL/VAX language and compiler that was written in VAX/VMS native mode and that provides compatibility with Dibol-11 source code. DBL/VAX costs $5,300 and is available from Digital Information at Suite 340, 3336 Bradshaw Road, Sacramento, Calif. 95827.
- Software Supply, Inc.'s Stream-Save, a streaming tape backup/restore utility program that speeds data transfers for LSI-11- and PDP-11-based systems. Stream-Save is priced at $450 from Software Supply at 4618 E. 6th St., Long Beach, Calif. 90814.

CW Photo by J. Beeler

The Dexpo West '82 Exhibit Floor

Every Fortune 100 Firm Seen Owning DSS by '90s

By Jim Bartimo
CW Staff

WALTHAM, Mass. — Calling the market for decision support systems (DSS) unpenetrated and unsaturated, the president of Chase Econometrics/Interactive Data Corp. predicted that every Fortune 100 company will have a DSS by the 1990s.

Speaking on "The Newest Executive Toy: Computers for Corporate Strategy," Carl Wolf last week told the New England Computer Law Forum here that there are three basic types of decisions: structured, which rely mostly on information; unstructured, which rely mostly on judgment; and semistructured, which rely somewhat equally on both information and judgment. "Decision support is a theory based on the fact that decisions are made on judgment and information," Wolf said.

To be effective, DSS must act as a data base that offers external data on subjects such as the sale figures from the competition. That information must correlate with other figures such as internal data, so an extraction and consolidation process must also be incorporated in the system, Wolf said.

A model base that includes industry models and company methods must also exist in the system, and the entire data base must provide a simple interface to the user, Wolf continued.

"The optimum hardware architecture for a decision support system is micro-to-mainframe," Wolf said, but Chase Econometrics has devised other uses for the personal computer in DSS until that technology is usable. Among those uses are a localized data base, a file-sharing network and a service by which a company can receive updated micro software and other services from Chase.

"The two things driving the personal computer into the executive suite are the technology and decision support," Wolf explained. "People have had the idea of decision support for a long time, but the hardware wasn't there to support it."

It is a fallacy that senior management will not use a terminal and keyboard, according to Wolf, who pointed out that he himself uses a personal computer and has found it extremely useful. "We're only scratching the surface of what we can do with micros."

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From National Symposium Keynoter

OA Advice: Avoid Excess Planning, Work Fast

By Bruce Hoard
CW Staff

NEW ORLEANS — Avoid excess planning and assemble office automation systems at an accelerated pace, keynote speaker Robert Woog told attendees at the Third National Symposium on Office Automation here last week.

Woog, district data systems manager for Advanced Office Systems Development at AT&T's Long Lines Division, discussed his experiences in developing a project office automation system at Long Lines that has matured into a production system with 5,000 users.

Woog was "time-bounded" when he built that system because he was expected to have users on the system in seven months and the project completed in 15 months. "We had tremendous pressure to do things now," he said at the conference, which was sponsored by the Data Processing Management Association.

Woog reported to four executive vice-presidents four times a year on the system, which was designed to help middle managers communicate better among themselves. Although Woog did not relish contact with the vice-presidents, he said it paid off when it came time to make spending decisions because they were informed enough to decide quickly and intelligently.

Traditional Approach Nixed

He did not want to follow the traditional approach of giving specifications to the DP department and letting it build the system. Instead, his group concentrated on an "iterative" process with users that involved repeated feedback until they were satisfied. The feedback was necessary because, as he put it, "users don't really know what they want. They're too busy to think about it."

The keynoter wanted to develop an integrated multimedia system that would include voice, characters and image and give users the capacity to switch easily from one medium to another within a flexible architecture. Because the computing environment at Long Lines was oriented around 3,000 programmers linked to large IBM and Amdahl Corp. mainframe computers running Cobol, it was necessary to ensure that the new office system was able to communicate in that environment.

Back in 1979 and 1980 when the project was in its initial phases, intelligent terminals sold for around $15,000 — more than Woog wanted to invest in workstations. To save time and money, he decided to introduce users to the system via in-place time-sharing terminals. By taking that approach, users were able to learn the system without being threatened by a terminal immediately on their desks, allowing them to grow into the system at their own paces, he said.

That strategy was successful as demand for access to the evolving system outstripped the ability of Woog and his group to accommodate them.

Once the system moved from the pilot to the production stage, it was necessary to be able to answer user questions, so the "system managers organization" was formed. The organization had a telephone number that could be reached from anywhere in the country, and through it experts were available for consultation.

When moving from pilot to production status, it is also important to realize the importance of increased productivity to a bottom-line minded top management, he said, adding system designers should be able to demonstrate in clear terms how increased productivity is cost-effective.

Although Woog's group did not know it would happen that way, the backbone of the system has turned out to be its electronic store-and-forward messaging system. Long Lines has since been experimenting with voice synthesis and electronic voice store-and-forward technology, of which he said, "I think it's going to be a big field."

Teleconferencing is another technology Woog has considered. He said it would be nice to provide teleconferencing services over standard black-and-white CRT terminals.

NBS Offers Booklet On Software Tools

WASHINGTON, D.C. — The National Bureau of Standards is offering a new publication, "The Introduction of Software Tools," to help organizations integrating automated software aids into software development programs.

The publication discusses issues associated with reducing management objections to software tools, how to reduce the chances of selecting the wrong software tool and how to ensure that software tools are compatible with existing hardware and software, a spokesman for the National Bureau of Standards said.

The publication, code number SP 500-91, is available for $4.75 from the U.S. Government Printing Office, Washington, D.C. 20402.

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Burroughs Unveils Its Largest System to Date

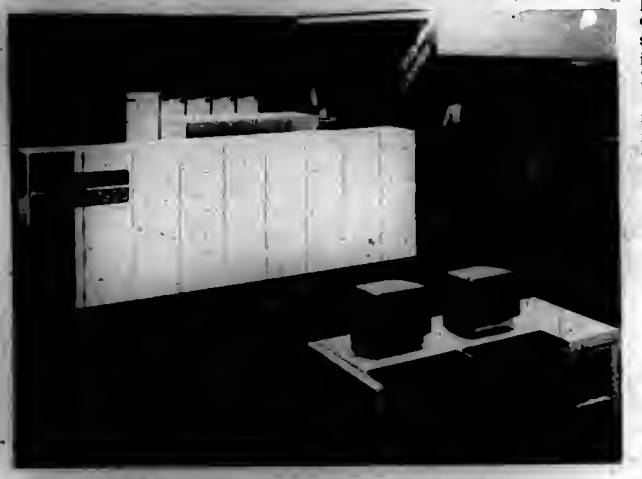
(Continued from Page 1)

• The B7900K, three processors and 36M bytes of main memory.

Each of the systems is field-upgradable to higher systems levels, the spokesman noted.

The B7900 uses distributed system architecture, which reportedly includes multiple specialized processing units, each with a different capacity and orientation to provide users with a balance of resources for varying work loads. Each unit includes a central processing module (CPM), which incorporates concepts of parallel pipeline architecture supported by multiple high-speed cache memories; the host data unit (HDU), a high-performance unit for high-speed concurrent data transfers; and an auxiliary processor said to be code-compatible with the CPM to allow processing of specified work off-loaded from the CPM.

Each HDU reportedly supports a burst rate of 24M byte/sec for data transfer. Multiple HDUs can be used in a single B7900 system.



Burroughs Corp.'s B7900 is the firm's largest system.

The memory capacity of all B7900 models can be expanded in 6M-byte modules up to the 96M-byte maximum. Each memory controller supports read/write buses for simultaneous operations with band capacity of 72M byte/sec, the spokesman added.

To boost system availability and capacity, Burroughs is offering a Partitioning, Availability, Capacity (PAC) kit that can be field-installed on any B7900. The kit includes a memory control unit, an auxiliary processor and an HDU, and reportedly it can also be used to separate a single B7900 system into two totally independent computer systems. The PAC kit costs $900,000.

The B7900 is said to feature full remote maintenance capability, including the use of the system itself for troubleshooting central system components. Maintenance requirements have been reduced through the use of large-scale and very large-scale integrated circuit technology, which has limited the total number of system components, the vendor noted.

Modular Power

Finally, the system's distributed design provides users with modular power supplies, fully redundant multiprocessor configurations and power regulator backup in each system cabinet, the vendor said.

B7900 system software is compatible with B5000, B6000 and B7000 systems and includes a full range of compilers, data management and communications facilities and applications generation systems, according to the vendor.

Shipments of the new systems are slated for the third quarter of 1983, with prices ranging from $2 million to $4 million.

Further details are available from Burroughs at its headquarters in Detroit, Mich. 48232.

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Presently, SOFT-SWITCH is being used successfully to link IBM and Wang word processors, with computers that run MVS. Support for additional equipment and devices is under development and will be available in the very near future.

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IMC Brings Out Publications

WASHINGTON, D.C. — The International Micrographic Congress (IMC) has announced two new books.

Video Disks in the Automated Office examines the current state of the art in video/optical disk technology and evaluates its use as a computer memory device. Among the issues addressed are capabilities and cost projections of these technologies, competitive considerations, history of image data systems, projected capabilities for optical data disks, the technology of digitizing, display and hard-copy terminals and comparisons of optical projection vs. electro-optical display. The book costs $39.

Records Management: Controlling Business Information presents guidelines and procedures for using computer data banks, word processing equipment, micrographics equipment and electronic mail. The book also demonstrates applications of the new technologies in a business environment. It costs $24.

Both books are available from IMC, Publications Sales, P.O. Box 34404, Bethesda, Md. 20817.

Disk Drives Also Unveiled By Burroughs

DETROIT — Burroughs Corp. last week complemented its introduction of a high-end mainframe by unveiling two high-capacity disk drives — the B9484-12, a 252M-byte removable disk unit; and the B9494-5, which offers 542M bytes of fixed disk storage.

The disk drives feature increased memory capacity, plus savings in floor space, power usage and the number of required data link processors, the vendor claimed. The disk subsystems incorporate Memorex Corp. read/write heads, while the disk platters used in each system incorporate the firm's "M Formula" disk coating.

Also announced with the two disk products were two controllers and an I/O communications exchange. The B9387-51 is a single-path controller while the B9387-52 serves as a dual-path controller, the vendor explained. The exchange reportedly carries the model number BX387-12 and allows up to eight paths to be connected to 16 disk drives.

The drives and their related controllers and exchanges will be available for use on the new series of B7900 mainframes. The B9484-12 will also be available for the B6900, B5900, B4900, B3900 and B2900 systems. The B9494-5 can be used with the B4900.

Delivery of the B9484-12 will begin in the second quarter of 1983, and the B9494-5 will be ready for shipment in the fourth quarter, Burroughs said. Prices start at $30,000 and $33,000, respectively.

Further details are available from Burroughs at its headquarters in Detroit, Mich. 48232.

RIT, DEC Ink Pact For Discounted Gear

ROCHESTER, N.Y. — The Rochester Institute of Technology (RIT) has entered into an agreement with Digital Equipment Corp. to offer DEC personal computers and professional workstations to staff members and students at substantially discounted prices.

A $4,800 DEC system, for example, will be available at RIT for approximately $2,800, according to a school spokesman. Students who cannot afford the computer equipment, which is necessary for many courses taught at the school, will have access to computers in the laboratory.

This agreement reflects RIT's recent commitment to integrating computing into the school's overall education experience. The pact also reflects DEC's use of the RIT campus as a research model for a new networking system that will be capable of linking all personal computers to each other and other campus computing facilities.

First User Testing Net 1000 Not Committed Yet

By Bruce Hoard
CW Staff

LOS ANGELES — Transamerica Corp. has become the first user to beta test American Bell, Inc.'s Advanced Information System AIS/Net 1000 network.

But that does not mean Transamerica has become the first Net 1000 customer. "We haven't made a 100% commitment," declared Jerry Pelzl, president of Transamerica Information Services, the subsidiary responsible for communications services throughout the corporation.

The intelligent, user-programmable network must pass two tests before Pelzl's company embraces it. First, it has to work and be the "handy, dandy protocol converter" that American Bell says it is. Second, the price must be right, Pelzl said.

Despite his attempts to clarify the pricing question, Pelzl said he still has an "insufficient amount of data" in that area.

Transamerica, which began beta testing the new network in September, should have a pretty good idea about its future plans — or lack of plans — for Net 1000 sometime in January, Pelzl said.

So far, Pelzl has successfully used binary synchronous communications devices to access Net 1000 and communicate with an IBM 3081 mainframe at the main computer center here. Asynchronous devices have accessed the network but not yet communicated with the mainframe.

Transamerica can link the network with any of its mainframes through IBM 3705 front-end processors.

The primary application which the company has in mind for Net 1000 involves providing its thousands of insurance agents nationwide with a protocol-transparent network that will allow them to communicate with the IBM mainframes for policy quotations no matter what kinds of terminals the agents are using.

"We don't have to do a lot of training or protocol education," Pelzl said of the test so far.

In the past, Transamerica agents in large field offices have communicated with headquarters via IBM 3276-type devices over leased lines.

No field locations are involved in the current testing. Instead, the company is simulating field conditions here at its Los Angeles facilities.

Asked if there have been any problems so far, Pelzl replied, "None in particular." He pointed out the burden is on American Bell — not Transamerica — to bring up a healthy network. To that end, he said American Bell has been "very responsive."

Pelzl was reluctant to compare Net 1000 with the competing Telenet or Tymnet networks, saying only, "We really haven't closed our doors on any alternatives, including building our own network." Another alternative, he indicated, is a possible network from the Insurance Institute of Research, composed of a number of insurance companies.

A spokeswoman for American Bell expressed confusion at Pelzl's lack of knowledge on pricing, saying, "We have a published price list that is available to the public."

She said the price list does not provide prices for specific calls because Net 1000 is a multifaceted, multivariable network. So it would be difficult "if he wants somebody to walk him through a demonstration of how much would it cost if . . ." the spokeswoman said.

Firms Endorse IEEE Standard

(Continued from Page 1)

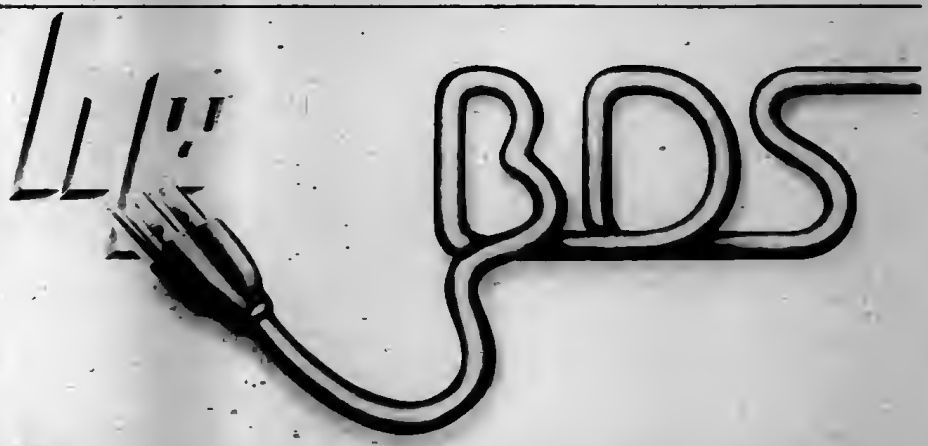
tions and European Computer Manufacturer Association [Ecma]," the release stated.

Just how closely the CSMA/CD standard should conform to Ethernet was a highly controversial subject during many of the 15 meetings held by the 802 committee. At a time when it looked as though the final draft might deviate significantly from Ethernet, Ecma voiced strong support for the Ethernet version, placing "tremendous" pressure on committee members to capitulate and adhere to it, according to industry experts who followed the proceedings.

The CSMA/CD document closely resembles the CSMA/CD portion of the "Blue Book" specifications developed jointly by DEC, Intel and Xerox for Xerox's Ethernet local-area network. Ungermann-Bass, 3Com and Interlan all manufacture Ethernet-compatible local-area network equipment and HP has announced its intention to offer a local network based on the Ethernet specifications.

In addition to its collaboration with DEC and Xerox on the original Ethernet specifications, Intel recently announced a set of very large-scale integration semiconductor chips that act as Ethernet controllers and are said to significantly reduce the cost of attaching workstations to Ethernet.

Maris Graube, chairman of the 802 committee, said the endorsement by companies that were previously "holdouts" is a boost for the committee and a positive step forward in the standards process, which has been going on since April 1980.



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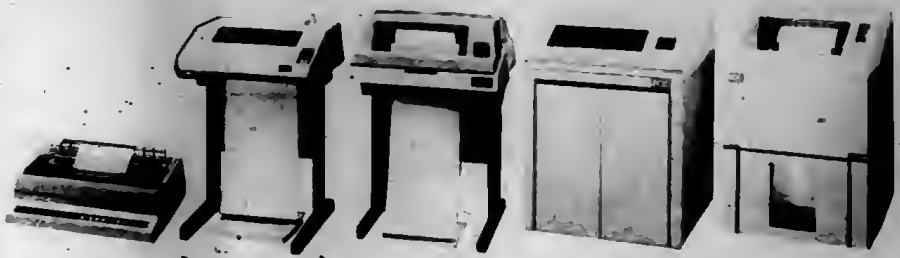

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ABI Discusses Net 1000 Pricing, Compatibility

By Phil Hirsch
CW Washington Bureau

NEW YORK — Advanced Information System /Net 1000 will interface with a wide variety of commonly used terminals and its price will be controlled largely by the customer's usage of four components: ports, storage, processing and "information movement."

These were two of several points discussed in detail last week by officials of American Bell, Inc. (ABI), who spoke here at a three-day seminar on Net 1000 sponsored by Technology Transfer, Inc. of Santa Monica, Calif. ABI is the separate AT&T subsidiary that hopes to begin offering Net 1000 on a nontariffed basis early next year.

The ABI officials explained at the seminar that the basic Net 1000 message path flows from a user's terminal, via an access line, to a service point at the Net 1000 network boundary. A number of computerized communications processing functions occur at this point — validation of the user's ID code and access authorization, activation of line and station communication handlers that provide the interface between the network and the user's terminal/access line and transfer of the input message to local or remote application and/or communications software.

Port capacity, processing capability, storage and/or information movement is involved in one or more of these activities. The term "information movement" encompasses transmission of bits from one network service address to another — typically between programs resident at different service points.

Each component is offered in a variety of forms, according to the ABI spokesmen. For example, there will be private line and dial-in ports, each available in several speed ranges. The private ports can be analog or digital; the dial-in ports, dedicated or shared.

Monthly Charges

Monthly charges for private line ports will range from $250 for 0 to 300 bit/sec analog service to $1,100 for 4800 to 9,600 bit/sec analog service.

The price of information movement depends on the number of bits transmitted, whether the customer specifies call or message service and the type of delivery he wants. Call service provides immediate delivery to a called program, while message service delivers to a store-forward buffer within the network subsequently accessed by the called party.

Timed and confirmed delivery is possible with either type of information movement. Message service additionally offers "priority" or "standard" delivery.

At each entry service point, Net 1000 supports asynchronous and synchronous terminal interfaces that allow both contention-based and polled line allocation schemes. The list includes teletypewriters, IBM 2741, IBM 2740 Model II, IBM 2780/3780, Dataspeed 4540 and IBM 3270 terminals.

At subscription time, the customer provides the network with a profile describing each of his terminals in terms of specified parameters such as special format control characters, link and format protocols, use or nonuse of echo cancelling and inactivity disconnect timeout. This profile is then invoked by a station handler that forms part of the service point's line interface.

Physically, the handler is located in an IBM Series/1 computer, which acts as the front-end processor for a Digital Equipment Corp. VAX-11/780 node processor. Similarly, a line profile is invoked by a line protocol handler that forms another part of the front-end processor-resident interface.

The Series/1 also includes a node interface. It generates Level 3 X.25 codes for incoming messages and calls addressed to application programs resident within other service points. The node interface triggers the generation of other needed X.25 codes by sending a message from the Series/1 front-end processor to software-based code generators within the VAX-11/780 node processor.

If the user's call or message is addressed to a locally resident application program, the front-end processor generates a "system call command" which, through the Net 1000 operating system, establishes a communications path to the operating system's applications layer.

The application program, in the course of processing, may have to access remote files or deliver the result of the processing to a remote program. In either case, the resulting calls pass through a service library on their way to the other node. The library, resident within the local node processor, contains subroutines that generate protocol codes conforming with Levels 3, 4 and 5 of the International Standards Organization's Open System Interconnection model.

When an application program in one service point calls an application program in another service point, then transmits the results of its processing to the latter facility, the bits are delivered to what ABI calls a station facility, an interface between the called application program and the network.

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What Net 1000 Means for End Users

NEW YORK — A major function of the Advanced Information System (AIS)/Net 1000 is to make information directly accessible to those who have to obtain it through intermediaries today, American Bell, Inc. Marketing Director Allen F. Rehert explained here last week.

For example, the customers of a trucking company who are looking for data on their shipments currently must call the company's local depot. The depot probably has a terminal, but the terminal is generally dedicated to order entry and would not have direct access to the needed shipment tracking information.

The result is a loss of time for both the shipper and the trucking company, plus the obvious degraded service.

"With Net 1000," said Rehert, "We could provide either direct access to the host computer for customers and the depot operator, or we could have the information downloaded into the network using Net 1000's storage and processing, at service points around the country."

The result would be "improved customer service, improved labor productivity [and] improved facility utilization," he said.

Execs Say Net 1000 Users Getting More Capabilities

By Phil Hirsch
CW Washington Bureau

NEW YORK — Customer programmability and nearby network resources are two key benefits available to users of Advanced Information Service (AIS)/Net 1000, the intelligent packet-switching network from American Bell, Inc. (ABI), top executives of AT&T's new separate subsidiary said here last week.

Those capabilities are not available from competing networks, specifically, the packet-switched offerings of GTE Telenet Corp. and Tymnet, Inc., contended ABI Chief Executive Officer Sal J. Barbera and ABI General Manager W.R. Smith, who spoke at a three-day seminar on AIS 1000 sponsored by Technology Transfer Institute of Santa Monica, Calif. The two capabilities, they added, provide the user with specific benefits:

- Net 1000 provides a common programming language rather than the application programs themselves, so the new service can be tailored to a customer's requirements. "The conclusion that the network would have to support programs written by the customers or their vendors [made it necessary to] provide a software architecture that would allow for . . . multiple changes during the market life of the network," Smith explained.

As a result, Net 1000's software architecture was conceived as a "strictly layered structure. The interface between the operating system and the customer software is a set of system commands that appear as statements available for inclusion in customer programs. These commands represent all the system functions available to the customer and define the logical capabilities of the network service," Smith said.

- Net 1000 offers improved response time, but reduced potential for transmission-based errors and interruptions. Smith reported that AT&T surveys indicate that polling messages account for 70% of the traffic load of typical private data channels, data entry commands account for another 20% and only 10% involves basic data processing at the host processor. "By placing the network logic close to the terminals, most of the transmission [can] be limited to short access channels," he explained.
- Net 1000 interconnects incompatible terminals and programs, enabling users to integrate separate, underutilized networks into a single, more cost-effective system, Smith said. At the Net 1000 network boundary, the user terminal's link protocol is converted to a common, open-ended intranetwork standard. Thus, as user terminal protocols are altered over time, they can be accommodated by modifying only the boundary interface, without forcing changes in either the user's communications software or the network's internal protocol, Smith pointed out.

Smith and Barbera also stressed Net 1000's open-endedness. This capability allows the user to modify an existing network configuration easily, making "intercompany data exchange a practical reality," Barbera said. A new system can be tried out without forcing the user to make a big capital investment, he added.

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Product Spotlight

Videotex/Teletex Ventures Operating Within the U.S.

By Phil Hirsch
CW Washington Bureau

The major videotex/teletext ventures now operating within the U.S. are:

• **Contelvision.** This two-phase trial in Manassas, Va., of a residential videotex system is being sponsored by Continental Telecom, Inc. (Contel), a subsidiary of the nation's second largest independent telephone company. The first phase, which began in October, will last at least six months.

About 100 viewers are accessing services that range from financial planning to children's video games. Some of the terminals consist of the viewer's existing TV set, to which a keyboard and adapter/decoder are attached. The others are French Teletel terminals equipped with 9-in. black-and-white display screens. Several gateways provide access to off-net data bases.

Phase 2 of the Contelvision trial will be a commercial market test and involve a greater number of households. Over 70 information providers reportedly are participating in Phase 1, and "many more" are scheduled for Phase 2.

• **Keycom.** The nation's first commercial teletext service, it began regular operation last month. Delivered via the vertical blanking interval of WTBS, the Atlanta "superstation," the service is transmitted by satellite to cable TV networks throughout the nation.

When the commercial service began, 70 cable systems were signed up. The service consists of a continuously updated "national teletext magazine" that includes more than 100 TV pages of sports, news, business, weather, leisure information and features of regional interest. Subscribers, equipped with British teletext decoders, use a key pad to specify and retrieve TV pages.

More than 500 Keycom terminals are expected to be in use by next February, and an additional 2,500 are anticipated by next summer. The service is operated by a consortium of Central Telephone and Utilities Corp., a major independent telephone carrier; Field Enterprises, which publishes the Chicago *Sun-Times*; Honeywell, Inc.; and Satellite Syndicated Systems, a satellite resale carrier.

• **First Bank System, Inc.,** headquartered in Minneapolis/St. Paul, Minn., launched a 5-month videotex trial last May. The viewers primarily are farmers located near Fargo, N.D. A total of about 250 Antiope decoder-equipped terminals provide teleshopping, news, electronic mail and agricultural advisory services. The information providers include more than 30 local and national merchants. One of them, J.C. Penny, is using a gateway facility to provide a teleshopping catalog, resident on its own computer, to participants in the "First Hand" trial.

Initially, services were offered gratis, but a monthly charge scheme was added later. The trial also tested the appeal of the "smart card" — a plastic credit card with an imbedded microprocessor chip — as a personal identifier and "electronic check book."

• **The Time, Inc. Teletext Service** trial features the use of a dedicated cable TV channel. As a result, much more information can be distributed in comparison to teletext systems employing the vertical blanking interval.

In addition, Time's trial involves downloading of software as well as information, providing the viewer with limited home computer capability. Another innovation is the termi-

(Continued on Page 14)

U.S. Applications

Antiope:
"First Hand," a videotex field trial, was sponsored by First Bank System, Inc., Minneapolis/St. Paul, Minn. Began May 1982.

Contelvision, a videotex field trial in Manassas, Va., sponsored by Continental Telecom, Inc. (Contel). Began October 1982. It uses the Cept-standardized display coding scheme.

NBC, CBS and two public television stations (KCET, Los Angeles; WGBH, Boston) are transmitting teletext "magazines" to limited audiences.

Prestel:
Kayfax, a commercial teletext service sponsored by a consortium of firms, including Contel Corp., Honeywell, Inc., Field Enterprises, Inc. and Satellite Syndicated Systems. Began November 1982.

Keytran, a commercial videotex service also sponsored by the above companies. Scheduled to begin in Chicago mid-1983.

KIRO-TV, Seattle; KSL-TV, Salt Lake City, Utah; Taft Broadcasting Co., Cincinnati; WJLA-TV, Washington, D.C.; and WGN-TV, Chicago are presently conducting trials using British Teletext coding scheme.

Telidon:
Time, Inc.'a Teletext Service, field trials in Orlando, Fla., and San Diego, sponsored by Time, Inc. Began October 1982.

Buick Motor System, closed user group videotex network. Began July 1982.

Times Mirror videotex trial, sponsored by Times Mirror Videotex Services and Infomart. Began March 1982.

Digital Equipment Corp. in-house videotex information network. Began spring 1982.

WETA, a test of the Telidon teletext system. Began June 1981.

NAPLPS:
Miami videotex "market introduction," sponsored by Knight-Ridder Newspapers, Inc. and AT&T. Scheduled to begin in fall 1983.

CW Chart

The Difference Between Videotex and Teletext

By Phil Hirsch
CW Washington Bureau

What's the difference between videotex and teletext?

Both videotex and teletext provide a relatively simple way of accessing information from remote data bases. Typically, it is done through either a key pad or a typewriter-like keyboard.

Both systems also utilize simple search strategies. The viewer reads through a numerically coded index, then inputs the code designating the information he wants.

An important limitation of both services is that they are not really designed to handle complex searching or retrieve a lot of information at one time.

In a videotex system, the user's numerically coded query, after passing through an interface device variously referred to as an adapter or decoder typically travels to the computerized data base via a dial-up phone circuit at 75 bit/sec. The information is then sent back, at 300 or 1,200 bit/sec over the same circuit; after passing through the decoder, it is displayed on the viewer's TV screen.

Teletext operates a little differently. The same components are at the ends of the message path, but the viewer is typically connected by a TV channel instead of a phone line.

Furthermore, the query, instead of being transmitted back to the data base center, is stored in his decoder. The teletext system transmits information in the form of TV frames, each of which is numbered. The frames are sent out in a continously repeated sequence. As each one passes the viewer's rooftop, the frame number is compared with the one previously placed in his decoder.

When a match occurs, the related frame is pulled from the passing stream and delivered to his screen.

A major virtue of videotex allegedly is that it is interactive. As a result, it is supposedly ideal for transaction-type services because the viewer, after receiving information about a product or service, can actually make a purchase.

In addition, videotex is supposed to accommodate a bigger data base. Essentially, this is because most teletext services utilize only the vertical blanking interval, the space between the frames of a regular TV program, rather than the whole channel.

The big advantage of teletext is held to be its low cost. In Britain, where most TV sets are rented, teletext service adds less than $4/mo to the user's charge. If he buys instead of renting, the teletext circuitry raises the price of the set some $100 to $150.

Prestel videotex adapters, by comparison, cost around $300. At the moment, Antiope and Telidon are more expensive than Prestel, and while no firm prices are available for NABTS/NAPLPS-compatible equipment, they are also certain to be more expensive than Prestel initially.

However, all of the above statements have to be qualified. For example, when teletext is transmitted on a cable TV channel, rather than over the air, the channel's entire capacity can be used, and the data base limitation disappears. Time, Inc. is now testing this approach in Orlando, Fla. and San Diego (see story above).

And while teletext, per se, is not interactive, it can be teamed up with telephone or cable circuits to create a two-way message path.

Current prices of videotex and teletext components are particularly suspect: much depends on production volume and rapidly changing technology, and what the user pays will depend, to a large extent, on how much of a subsidy the information provider is willing to give. In France, for instance, videotex terminals are being given away free to create a market for remote data base services.

Product Spotlight

Critics Seek Application for Videotex/Teletext

(Continued from Page 1)
mation providers in this business.

A number of market tests are under way or in the planning stage. Last month, for instance, a consortium of firms launched Keycom, reportedly the first commercial teletext service to be offered within the U.S. The cooperating firms included Central Telephone & Utilities Corp., Honeywell, Inc. and Field Enterprises, Inc., publishers of the Chicago *Sun-Times* (story on Page 12).

Integrating With Services

However, it will be a while before many U.S. homes and offices are equipped with videotex/teletext terminals. To overcome the lack of prospects, videotex developers are busily integrating their hardware and software with other types of data communications services.

Rediffusion Computers, a British company, recently unveiled a line of intelligent Teleputers that can handle traditional computer output, videotex display, videodisk pictures and even videocassettes. Last June, IBM announced software that makes data stored within its general-purpose Series/1 computer accessible to users equipped with videotex terminals. Simultaneously, the software allows the Series/1 to support nonvideotex terminals, so both types can access a common text data base.

Integrating videotex terminals into nonvideotex electronic information systems is one way of getting around the inability of videotex systems to talk to each other. The major incompatibility is between the UK's Prestel and Cañada's Telidon. One difference relates to the teletext transmission format employed by each system. The other concerns the coding scheme used for teletext and videotex displays (story below).

Besides incompatibility, there is uncertainty about present and future markets for videotex/teletext services. From records racked up by Prestel, Ceefax, and Oracle, certain applications seem to have enough appeal to be commercially viable. But little is known about many others.

The marketing track records explain why current videotex/teletext activity in the U.S., as well as most other countries, consists primarily of field demonstrations and market trials. As a result, it seems likely that videotex/teletext will evolve gradually from local, specialized services serving a primarily business audience to general-purpose networks operating on a nationwide basis, interconnecting the local nets through gateways.

How quickly this will happen is anyone's guess at the moment, but within a year or two the trials now under way may provide some answers to that question.

Videotex	Teletext	Developer
Antiope* ("Teletel")	Antiope	France
Prestel* ("Viewdata")	Ceefax Oracle	Great Britain
Telidon	Telidon	Canada
NAPLPS**	NABTS***	United States

* Prestel, as well as the European version of Antiope, conforms to the Cept standard, a display protocol adopted by western European telecommunications administrations.

** North American Presentation Level Protocol Syntax, developed by AT&T. The protocol is based largely on Canada's Telidon system. Canadian videotex decoders, as well as those manufactured by the French for use in North America, will be compatible with NAPLPS.

*** The North American Broadcast Teletext Standard is a proposed transmission protocol, developed by CBS, France and Canada. NAPLPS is a part of NABTS.

CW Chart

Teletext, Videotex Employ Different Techniques

By Phil Hirsch
CW Washington Bureau

While teletext and videotex systems seem basically the same, each one employs its own techniques and transmission characteristics.

The British use a "fixed, synchronous" format to transmit teletext on a TV channel, while the Canadians and French employ a "variable, asynchronous" scheme. CBS, chief developer of the North American Broadcast Teletext Standard (NABTS), a proposed U.S. teletext protocol, also uses the latter format.

In a fixed-format system, one byte of display information is transmitted for each screen character position.

A synchronous format requires each block of teletext display information to be transmitted on a specified raster line within the vertical blanking interval — the space between the frames of a TV signal.

By comparison, a "variable" transmission system sends data only for those places on the screen where information is to be displayed. Asynchronous transmission means the data can be placed on any raster line, since the relative position of transmitted information is not related to the position of that information on the screen. Instead, the code representing the information includes a screen address.

In March 1981, the United Kingdom Teletext Industry Group submitted a proposal for a fixed synchronous U.S. teletext standard to the Federal Communications Commission (FCC). A few months later, CBS proposed its NABTS to the same body.

Early this year, the commission sidestepped controversy by proposing a standard that would specify certain basic transmission parameters, but would let the market decide whether fixed or variable, synchronous or asynchronous transmission was best. Comments on the FCC proposal were then invited, and the commission received several hundred. It is generally expected that the commission will finalize the standard it proposed several months ago.

The other major source of incompatibility among videotex/teletext systems involves the codes used to represent graphics information displayed on the TV screen.

The British employ an "alpha-mosaic" graphics display system — a set of characters each divided into six cells. By shading or coloring certain cells and leaving the others blank, a variety of shapes are created. The graphics seen on a Prestel screen are formed by combining these alpha-mosaic characters.

The French also use alpha-mosaics, but employ a coding system different from the British scheme. Canada's Telidon system is based on "alpha-geometric" coding, while the North American Presentation Level Protocol Syntax (NAPLPS) supports a combination of alpha-mosaics and alpha-geometrics.

Regardless of which system is employed, the code for each character position consists of two parts: one, a set of bits that identifies the character itself; the other, a code specifying the related attributes of that character. Color is one attribute. Others specify whether the character is to be flashed on and off and whether the character is to be displayed higher or wider than its neighbors.

Prestel, the British system, initially employed a "spacing attribute" system — codes were inserted into the blank spaces between words and sentences, and when the signal reached the terminal decoder, character and attribute codes were stored serially in the same memory. The big advantage was that memory costs were minimized; however, the British were unable to assign attributes to every character, since not enough blank positions were available.

The French sidestepped this problem by building decoders with double memories and by using a "parallel attribute" system. The attribute codes went into one memory, and the character codes into another. The Canadians also used the same basic plan, but their alpha-geometric character coding system is totally different from alpha-mosaics.

In an alpha-mosaic system, all characters representing both text and graphics are stored in read-only memory within the decoder. The system operator transmits a set of addresses that retrieve the related characters from storage and transfer them to the TV set's display generator.

In an alpha-geometric system, however, the service operator transmits codes representing graphics "primitives," such as an arc, line, point or circle, along with a set of spatial end points. This information is then converted by a microprocessor, within the decoder, into the specified graphics image.

Telidon's display coding scheme is the basis for the alpha-geometric part of the proposed NAPLPS standard now awaiting final action by the American National Standards Institute (Ansi). NAPLPS also provides for transmission of alpha-mosaic graphics, using the parallel attribute system devloped by the French for Antiope.

AT&T, which drafted the first version of what is now NAPLPS, is the chief supporter of the specification in this country. The French and Canadians also have endorsed it. But the French intend to implement NAPLPS only in those decoders shipped to the North American market. Meanwhile, the decoders they produce for other markets will conform to the standard of the Conference of European Postal and Tele-

(Continued on Page 14)

Major Technical Characteristics

Antiope:
Variable, asynchronous transmission format; parallel attributes. The European version provides alpha-mosaic graphics, the North American version includes alpha-geometric graphics as well.

Prestel/Ceefax/Oracle:
Fixed, synchronous transmission format; serial attributes; alpha-mosaic graphics.

Telidon:
Variable, asynchronous transmission format; parallel attributes; alpha-mosaic and alpha-geometric graphics.

NABTS:
Variable, asynchronous transmission format; parallel attributes; alpha-geometric and alpha-mosaic graphics.

CW Chart

U.S. Auditioning Videotex, Teletext Ventures

(Continued from Page 12)

nal interface which Time calls an "intelligent addressable cable TV converter." It consists of a conventional converter, with additional memory and a video display generator.

One of the company's marketing objectives is to produce "a fully integrated converter/teletext decoder that would cost the cable TV system operator no more than $150, allowing teletext to be offered to consumers for $5 to $10/mo." The trial, based on Telidon technology, is being conducted in Orlando, Fla., and San Diego, jointly with local newspapers. A.C. Nielsen Co. is interviewing the participants to find out which services they prefer, and six major advertising agencies are serving as project consultants.

• The Buick Division of General Motors Corp. has been operating a Telidon-based **Product Information Service** since last July. Terminals are located in the Buick dealer showrooms, tied to a computerized data base at division headquarters in Flint, Mich. Through key pads, customers and dealers can access specific information about Buick automotive products. Reportedly, this is the first commercial application of videotex in the automotive field.

• **The Infomart-Times Mirror Trial.** A videotex trial that utilizes both cable TV channels and dial-up telephone circuits is scheduled to end this month in Southern California. Sponsored by Infomart, a Canadian company set up to promote Telidon, and by the Times Mirror Co., the trial began last March.

This service is providing on-line teleshopping, home banking, electronic messages and news services to 350 viewers in Mission Viejo and Palos Verdes, Calif. The former community is served by cable, the latter by circuits leased from Pacific Telephone and Telegraph Co.

The electronic message service features a "bulletin board," where any participant can offer items for sale or place other messages of general interest and a store/forward electronic mailbox. When a "letter" is deposited in the mailbox, the recipient is alerted automatically as soon as he turns on his terminal.

• **WETA**, the public TV station in Washington, D.C., claims to be the first in the U.S. to broadcast Telidon-formatted teletext using the vertical blanking interval. The WETA test began in June 1981 and is currently funded through next September. Ten terminals, installed in a number of public locations, dispense weather, news reports and public service information.

• **Viewtron.** AT&T and Knight-Ridder Newspapers, Inc. announced a videotex field trial in Miami to begin next summer. Plans called for about 5,000 terminals. Now, the "trial" is a "market introduction," and it is scheduled to begin next fall. This will be the first public appearance of AT&T's new local-area data transport system, which permits existing analog local loops to carry digital data simultaneously with voice.

In 1985, Knight Ridder, presumably in collaboration with AT&T, plans to install Viewtron systems in Philadelphia, Detroit, San Jose, Calif., and Charlotte, N.C. Meanwhile, the company has already begun marketing Viewtron technology to other publishers. Preliminary joint venture agreements have been signed with papers in Boston, Kansas City, Mo., and Fort Worth, Texas.

More information about the Antiope-based systems discussed above can be obtained from Antiope and Telematics, Inc., 149 E. 61st St., New York, N.Y. 10021. Prestel's chief U.S. information outlet is British Videotex and Teletext, 666 Third Ave., New York, N.Y. 10017.

Information about Telidon is available from Videotex America, 2375 Morse Ave., Irvine, Calif. 92714. Information about Viewtron can be obtained from Viewdata Corp. of America, 1111 Lincoln Road, Miami Besch, Fla. 33139.

Each Use Own Techniques

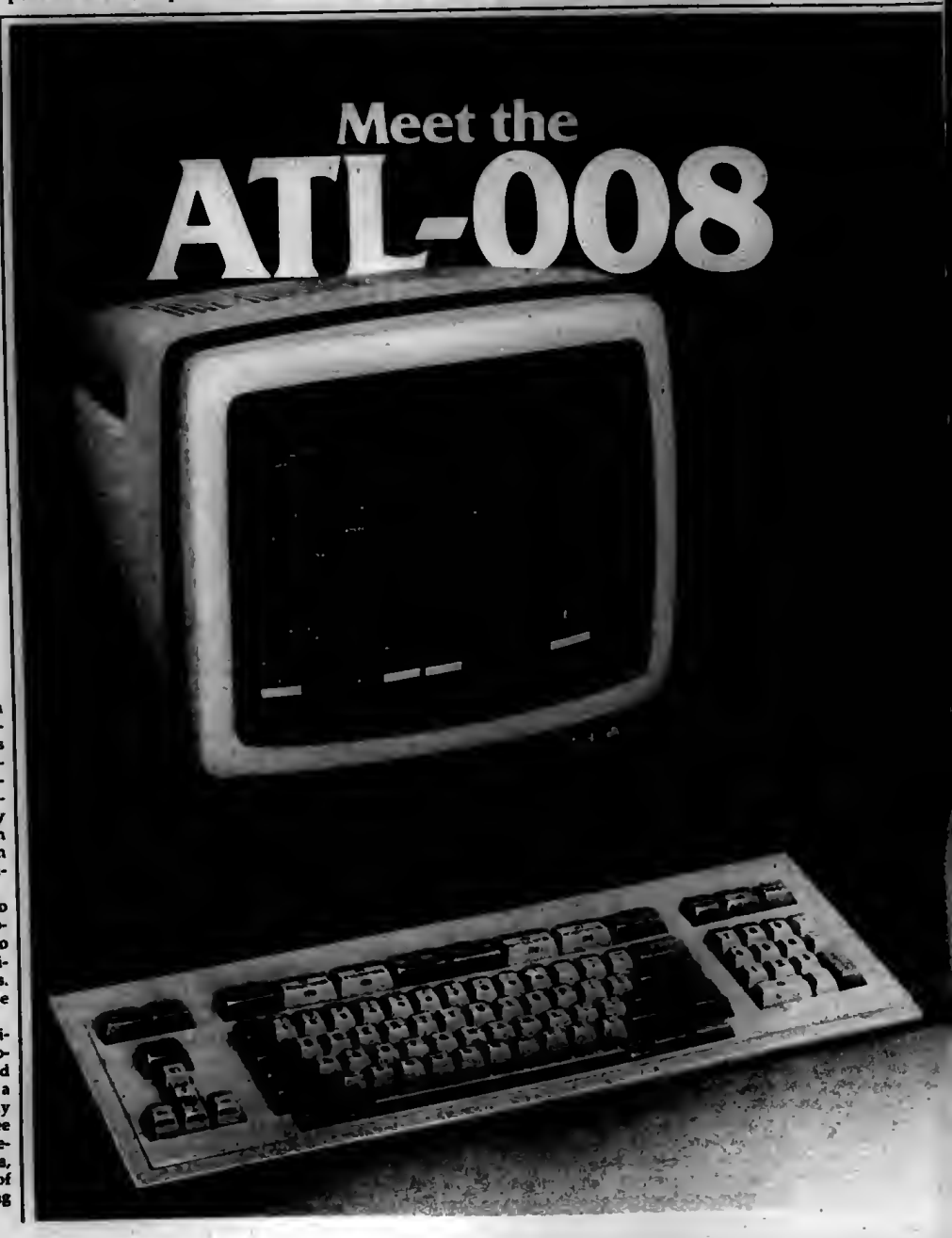
(Continued from Page 13)

communications Authorities (Cept).

Cept is an association of Western European telecommunications administrations which, several months ago, adopted a standard that encompasses both the British spacing attribute and the French parallel attribute systems, but is significantly different from either. Thus, although both the European and American coding specifications include alphamosaics, they remain incompatible.

Cept officials have been trying to persuade AT&T to accept a compromise that would integrate the two proposals, but phone company officials have rejected all overtures. However, an agreement may still be possible.

Last October, Canada's communications minister, Francis Fox, proposed a marriage of Cept and NAPLPS. Fox made his proposal at a meeting in Cannes, France, shortly before the Consultative Committee on International Telegraphy and Telephony (CCITT) met in Geneva, Switzerland, to consider adoption of a worldwide videotex display coding standard.



Adapso Opposes Board's Proposal

WASHINGTON, D.C. — The Association of Data Processing Service Organizations, Inc. (Adapso) has filed comments with the Federal Home Loan Bank Board opposing the board's proposal to allow federally chartered banking associations, including savings and loan institutions, to offer a range of DP and transmission services.

Adapso said it opposed the plan for three reasons: the board exceeded its regulatory authority, the proposed financial institution activities are illegal and the services are potentially anticompetitive.

"Federal associations enjoy a unique, government-granted franchise to extend credit," Adapso said. "Should the customers of federal associations be induced or permitted to believe that the availability of essential credit and other regulated services will be enhanced if they also give some or all of their data processing business to the association, the ability of the independent data processing services vendor to compete will be severely and unfairly limited."

Adapso also argued that federal associations "enjoy certain unique, government-granted tax exemptions, which should not be passed on to savings and loan data processing customers in the form of lower prices."

Senate Resolution Backs National Science Center

WASHINGTON, D.C. — The U.S. Senate has adopted a resolution recommending the establishment of a national science center for communications and electronics.

The measure, approved Dec. 1, was introduced by Sen. Harrison Schmitt (R-N.M.), a former astronaut. The resolution recognizes the importance of science and technology for U.S. defense and industrial needs and notes a "dwindling superiority" of this country in communications and electronics.

Therefore, the resolution says, "Congress shall take a leading role in making the public, corporate and governmental worlds aware of the importance of assuring and maintaining the scientific and technological superiority of the United States in the area of electronics and communications, and to encourage the establishment within the United States of a national center dedicated to communications and electronics."

Private Donations

According to Schmitt and Sen. Sam Nunn (D-Ga.), another supporter of the resolution, the center would be financed by private donations. A nonprofit foundation was created in 1980 by individuals in the electronics industry to raise $18 million to build the center.

The Army has agreed to donate 43 acres of land at Fort Gordon, Ga., to house the center and to maintain and operate the facility, which would be used for training purposes.

"As currently envisioned," Nunn said, "the center will utilize new techniques of graphics and electronic media arts, advanced instructional technology and all forms of new computer and communications systems to fulfill its mission." In addition to 33,000 U.S. and American allies' military students who would use the center annually, the facility would be available to other students and the general public, Nunn said.

Tax Credit Bill Aims at Micros

WASHINGTON, D.C. — Motherhood, apple pie and the home computer may be the new symbols of The American Way.

In an effort to keep families together more often and to strengthen loosening family ties, Rep. Newt Gingrich (R-Ga.) has introduced a bill that would give families tax credits toward the purchase of home computers.

"The advances in technology earlier in this century have created a mobile society which apends more and more time away from home for working, learning and recreation," Gingrich observed.

"This has weakened the family ties that are so important to the values and strengths of America. Now the home computer offers a reversal of this trend," he suggested.

Slated to be reintroduced when Congress reconvenes in January, the Family Opportunity Act would allow a $100 tax credit each year for every family member for up to five years, or half the price of a computer or the computer programs purchased.

Business capital depreciation allowances in the tax cut passed in 1981 still apply to business use of minicomputers, Gingrich pointed out. "If you decide to use the computer as a home office, you can choose the tax break that benefits you most," he added.

"The reason I'm introducing a tax credit is to allow families to buy a home computer who couldn't afford to otherwise," Gingrich noted. "I think home computers can be a new source of freedom for many families in this country."

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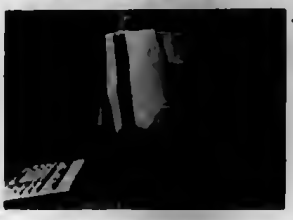

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Does Space Invaders Savvy Predict DP Success?

By Susan Blakeney
CW Staff

Are the games people play any indication of the careers at which they would excel? With regard to video games and data processing, educators disagree.

Ann Lewin, director of the Capital Children's Museum in Washington, D.C., believes the children who will end up winners are those who will be able to access computer information. Lewin also believes that male children are in a better position to be the winners.

Assume for a moment that a correlation does exist between video-game agility and programming competence and the above might constitute a legitimate concern. However, many social scientists disagree with the theory that a male's affinity for Space Invaders will later oust his female counterpart in the labor market.

"Boys are definitely more turned on to the games. But look at the nature of the games — they're always blowing things up!" observed Dr. Elizabeth Useem of the University of Massachusetts' Sociology Department. "But if you look at who wants to get into computer science as a career, there are a fair number of women interested."

Useem cited the national high school average in 1982, according to the Educational Testing Service (the SAT company): 8.8% senior-year high school males selected computer science as the field of study they wished to pursue, and 6.7% of the females did the same.

"Girls are right up there in computer science," Useem continued, "and furthermore, many of the experts on the use of computers in schools are women."

Research also shows young girls are more interested in educational computer games than the shoot-em-up types, and furthermore, that women view the computer more as a tool, while many men look it as a toy.

"Girls are interested when they can do something meaningful with the machine," remarked Beverly Hunter, a computer researcher at Human Resources Research Organization in Alexandria, Va.

When asked if she thought girls took the back seat to boys in computer science, Adelaine Naiman, director of software for Human Relations Media of Pleasantville, N.Y., said, "First of all there's an enormous shortage of research on the subject . . . but until puberty, there is no difference between boys and girls working with computers. In fact, until puberty, girls are slightly better at the math," Naiman argued.

She said that while the boy/girl ratio in video game arcades favors the boys, she feels that the real reason boys might have the jump on girls in the computer field is that so many women are faced with culturally in-bred computer anxiety.

"It's the socialization process that keeps girls from being comfortable with any kind of technology . . . Society doesn't want them to be. It's unfeminine," Naiman stated. "So girls end up excluding themselves."

Naiman maintained that girls are not necessarily intellectually different from boys with relation to computers, because when encouraged, they do just as well. However, "You cannot avoid the fact that from birth we are socially conditioned," she said.

Dolores McCarthy, class manager at Control Data Institute in Quincy, Mass. noted that the ratio of men to women enrolled in the school's intensive programming course is approximately 70 to 30, and recalls being discouraged by an advisor in high school that the advanced math courses "were for boys." McCarthy sees this situation changing, "finally." The recent findings of the National Science Foundation concur with McCarthy: 26% of the total number of people working in the computer field are women.

Dr. Useem believes computers should be introduced to children at the elementary school level, and schools should guard against boys monopolizing computers lab time. She noted that boys have a tendency to become computer addicts and scare the girls off from competing for computer resources. She pointed out that some schools in California have established "girls only" computer hours to alleviate such problems, and other schools would do well to "think of creative ways to avert these situations."

Software Standard Details Design Costs

ESTILL SPRINGS, Tenn. — A software documentation standard said to provide a basis for lower software life-cycle costs has been introduced by Associated Technology.

The 58-page standard is said to cover all elements necessary for documentation of a detailed software design. Included is information for documentation of structured program designs, data bases, external interfaces and quality-assurance provisions.

The standard is intended for software engineers, documentarians, quality assurance management, technical users and contract administrators. It costs $20 from Associated Technology at Box 448, Rt. 2, Estill Springs, Tenn. 37330.

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Three Popularly Held Misconceptions

Keynoter Dashes OA Fantasies at WIP Meet

CW Photo by S. Blakeney

Barbara Babcock

By Susan Blakeney
CW Staff

NEWTON, Mass. — There are three popularly held fantasies about office automation, according to Barbara Babcock, a market development manager involved with office products at Data General Corp.

"Fantasy No. 1: The office is just waiting to be automated. This is a vendor fantasy — it has no basis in reality. Fantasy No. 2: Two memos are better than one. Wrong. Fantasy No. 3: All offices are the same. Again, wrong."

Babcock made these observations when she keynoted the Boston Forum's Women in Information Processing (WIP) meeting held here last week.

"Many people think of office automation as a very special terminal that completely eliminates paper, is 100% responsive to commands and is perfectly capable of doing everything," Babcock continued. "This is just not so."

Furthermore, Babcock said it is a mistake to compare office automation implementation with data processing. She warned against this practice because she maintained that while DP systems act to expedite redundant work, they are task-oriented, intended for use by technical professionals and demand that the user adjust to the system. Office automation, on the other hand, focuses on more ad hoc unstructured user needs and is not driven by the technology like DP, but user-driven, she said.

The office process spans across personnel lines and must be able to address the needs of secretaries, professionals, middle management and executives, Babcock noted. "Secretaries worry about the form of the information. Professionals are concerned with content. Managers on up look for usability, understandability and security," she stated.

Babcock suggested that the office automation system must be tailored to fulfill each of these user's special needs. Such a system would incorporate word processing, electronic mail, electronic filing, administrative support functions and a solid decision support system.

She also disagreed with the theory that office automation would put people out of work. "Office automation would not necessarily change the people functions in the office, but rather the approach to these functions, resulting in an enhanced working environment and, therefore, benefit the individuals as well as the business," she said.

Babcock went on to say that office automation is likely to create a large rift betwen the competents and the incompetents in the typical office, because the automation will serve to expedite competency.

DSS Drawbacks, Gains Weighed

NEWTON, Mass. — Decision support systems (DSS) have not caught on in a big way because they don't reflect the way managers think, according to Data General Corp.'s market development manager Barbara Babcock.

Babcock was the keynote speaker at the Boston Forum's Women in Information Processing (WIP) meeting held here last week.

Babcock also said DSS were a necessary ingredient to a proper office automation system, but they were hard to cost-justify because decision-making is an unstructured, unmeasurable process. Furthermore, she claimed, "there aren't any particularly good DSS products out there right now."

"[Visicorp's] Visicalc is OK," Babcock continued, "but it takes twenty hours to learn how to use it properly. How many managers do you know who would want to spend twenty hours learning how to use a tool?"

A good DSS, in Babcock's book, should be able to off-load routine tasks, improve communication and access to information. The DSS should be a corporate resource that everyone in an organization could tap, she stressed, so that "people could work smarter — not harder."

Despite their problems, Babcock said DSS are beginning to catch on because of attractive prices, availability, user awareness and competitive pressures.

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Hart Airs Industrial Policy At NAM High-Tech Meet

By Marguerite Zientara
CW Staff

CAMBRIDGE, Mass. — The service sector is "not a threat to traditional manufacturing operations and may be their salvation, if we only learn how to take advantage of it by automating the manufacturing work place," according to Sen. Gary Hart (D-Colo.).

Currently testing the political waters with an eye toward the 1984 Democratic presidential nomination, Hart was barraged with more political than technological questions at a press conference held here during the National Association of Manufacturers (NAM) High-Tech Meeting.

The meeting came two days after Sen. Edward M. Kennedy (D-Mass.) had announced his decision not to run in 1984.

CW Photo by M. Zientara

Sen. Gary Hart

Seven-Point Plan

In his address, Hart called for an end to the "ad hoc industrial policy made up of subsidies and benefits for individual industries," noting the $455 million in tax breaks given the timber industry in 1980 "while the semiconductor industry received no direct assistance."

The U.S. needs "a more rational set of policies ... which will help growing industries succeed and older industries become and remain competitive," Hart said, offering e seven-point policy plan.

According to Hart, the country needs:

- A process initiated by the president to bring about industry-by-industry agreements on modernization and growth.
- A revised approach to trade to provide "greater competitiveness and greater access for American products abroad." Hart cited e bill he introduced this year, developed with the help of the semiconductor industry, to promote liberalization of trade regulatione "instead of the restrictive protectionist policies of foreign competitors."
- Review and revision of our regulatory policies to ensure they are supportive of our efforts to strengthen American opportunities.
- Increased government support for research and development. "We should also encourage cooperative research programs among private companies," Hart said, in "one of the key domestic initiatives needed to spur the development of our high-tech companies." Hart said he will introduce e bill this year to "exempt companies from some antitrust prosecution which today prevents joint and cooperative research."
- "Invest heavily in education, training and retraining." Hart has introduced legislation to improve "our deficient science, math and language studies" through the investment of public monies.

In addition, "The training and retraining of literally millions of American workers in the existing work force will be possibly the major employment challenge of the 1980s," Hart said.

"We can't continue this laissez-faire system that lets these workers go out on their own and lets them exheust their unemployment benefits without further assistance," he edded. "We need e broad-scale, flexible public policy for this transition period in industry."

- Enlarge the pool of available capital "by identifying and employing e lot of existing underutilized capital resources, such as pension funds," Hart said, noting they constitute "an enormous potential source of capital: $800 billion this year, $4 trillion by 1995."

At the state level, state department finance corporations should provide small businesses not only financial assistance but physical resources such as computers, laboratories and office space and managerial resources such as management counseling and assistance in labor negotiations, Hart suggested.

- "Encourage entrepreneurial activity in all areas of industry," he said, noting, "One reason I reject the Jepanese model for industrial growth is that its emphasis on centralization and consensus works to inhibit the risk-takers, the entrepreneurs."

Courses Added To Seminars On Management

NEW YORK — Software International Associates, Inc. has added two training courses to its line of computer resource management seminars.

The "IMS/DC Operations" course has been designed to improve operators' productivity and responsiveness in an IBM IMS Data Communications environment. This is accomplished by intensive reviews of operational procedures with emphasis on recovery and restart procedures and diagnostic techniques, a vendor spokesman said.

The "MVS Operations" course has been designed to improve the efficiency and effectiveness of an MVS operations staff. This is eccomplished by reinforcing the knowledge of MVS components and subsystems and their interaction in an operations environment, according to the spokesmen.

Customized in-house seminars are offered at $1,000/day. Further details can be obtained from the vendor et Suite 417, 132 Nassau St., New York, N.Y. 10038.

Mail-Order Food Firm Handles Holiday Rush With Part-Time Gear

MARSHFIELD, Wis. — When visions of sugarplums dance in the heads of holiday food mail-order house managers, they usually mean headaches from the avalanche of mail orders that descend between Thanksgiving and Christmas.

At Figi's, Inc., reportedly the second largest mail-order food/gift firm in the U.S., they spell relief with additional personnel and beefed-up on-line computer capability.

Figi's "Gifts in Good Taste" catalog presents more than 250 gift-pack items, including 47 varieties of cheese, processed meats and sausage, fruits, pastries and candies. The firm does 90% of its yearly volume in the six weeks before Christmas, with orders reaching levels of 25,000/day.

Work Force Mushrooms

As work loads swell, Figi's work force mushrooms from about 200 to more than 1,400. In addition, the role of the firm's IBM 4341 and System/370 Model 158 becomes "pervasive and critical," according to Joseph E. Fouts, president of Figi's Data Center.

At this time, the firm brings in additional temporary systems hardware, including printers, data storage disk files and CRT terminals. "Normally, we'll have 40 IBM 3278 terminals on-line for data entry and verification," Fouts said. "Over the peak season, we bring in 48 more terminals, which we lease from IBM for 30-, 60- or 90-day periods."

For extra personnel, Figi's hires about 150 temporary workers for data entry. As the temporary workers are brought in, part of the Data Center becomes a short-lived but large-scale training center.

"Repeaters" rehired after working the previous peak season usually need only a day-long refresher course on the terminal, while new operators need 30 to 40 hours of intense training, Fouts explained.

The best of the repeaters achieve productivity levels of 90% of the regular full-time workers and the new temporary operators can be expected to achieve half the levels of full-time workers, he said.

The work load includes order entry, order acknowledgment, order processing and handling of order changes and status inquiries from customers. All of this adds up to an average of 800,000 keystrokes per hour on on-line terminal keyboards and more than 13,000 on-line terminal data transactions per hour during peak season, Fouts claimed.

More than nine out of 10 orders coming in are accom-

(Continued on Page 20)

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Photo from San Francisco Opera's production of Samson et Dalila heard nationwide on NPR stations.

'Father of Robotics' Wins Award for Pioneering Work

NEW YORK — Joseph F. Engelberger, founder of Unimation, Inc. and the Robot Institute of America, has been named the 18th Annual American Machinist Award winner by *American Machinist* magazine.

Engelberger has been called the "Father of Robotics" for his pioneering work in the field, which spans 25 years. He has dedicated the bulk of that time striving to relieve factory workers of tedious and dangerous work through the use of industrial robots.

In 1956, Engelberger met George Devol, who had a patent application for "programmed article transfer." Soon after, Engelberger formed his own company called Consolidated Controls, which by 1959 had completed its first prototype universal helper, dubbed Unimate. These early models that went to General Motors Corp. (GM) and Doehler-Jarvis performed loading and unloading tasks and tended toward hot diecasting machines.

Unimation, Inc. was subsequently formed as a joint venture of Pullman Corp. and Condec. It was not until 1967, however, that a quantity robot order was placed. The order came from GM, which was building a new car assembly plant in Lordstown, Ohio. The facility became Unimation's first major installation, and the captial-intensive automobile companies soon became the biggest consumers of robots, with spot welding the single most frequent application.

In 1974 Engelberger harnessed the increasing interest in robotics with the establishment of the Robot Institute of America. Unimation, meanwhile, has captured a 35% share of the U.S. robot market with annual sales of $73.2 million.

Engleiberger plans to continue to run his company.

Rush Handled With Peripherals

(Continued from Page 19)

panied by a check or money order or a credit card number. In the order processing routine, the system breaks out all accounting data.

The system accumulates dollar totals on credit card purchases by card type and prepares the billings to the credit card issuers. On invoiced purchases from repeat large-order customers, the system first checks against a credit file, then produces a bill that goes out to the customer the same day the order comes in, Fouts explained.

The computers also keep continuous tabs on the different gift packs ordered and produce daily sales reports as well as providing current order total by gift pack on demand.

The sales data reflecting incoming order patterns by item demand is also helpful in scheduling production priorities for gift packs assembled from the vast product inventories Figi's accumulates prior to the start of the peak season.

Shipments Scheduled

Verified orders awaiting shipment are held on the order file in segmented batches by geographical Zip Code and gift pack cube and weight. As Christmas draws near, the computer system schedules the shipments, via truck, to 50 different United Parcel Service (UPS) and Parcel Post distribution points around the nation.

The system also keeps a running total of progressive cube space by truckload — about 220 truckloads will move out during the season — to maximize shipping efficiency.

The system also automatically produces payment checks to the UPS and Parcel Post distribution points.

Three-Day Cape Seminars To Focus on Teleprocessing

ORANGE, Calif. — The Center for Advanced Professional Education, Inc. (Cape) has announced a winter schedule of seminars focusing on Systems Network Architecture (SNA) and teleprocessing access methods.

The seminars are aimed at programmers, systems analysts and other professionals who need current information in communications areas, Cape said.

The three-day seminars cover the evolution of data communications software, with emphasis placed on teleprocessing software requirements, monitors including CICS/IMS and concepts, protocols and various implementations of SNA, Cape said.

Dates for the seminars are: New York City, Jan. 5-7; San Diego, Jan. 19-21; Arlington, Va., Jan. 26-28; and Detroit, Feb. 2-4. All seminars are under the direction of Atul Kapoor, a telecommunications professional experienced in planning, analysis, design and management of large on-line systems, Cape reported.

The registration fee and coursebook are priced at $595. More information is available from Cape at 11928 N. Earlham, Orange, Calif. 92669.

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Users the Solution for DP Quality?

Q I just celebrated my 10th year in data processing. I've worked my tail off and have spent many sleepless weekends at the computer center. Yet neither I nor my product (software) is well thought of in other areas of our business.

Software is attributed directly to me and my colleagues. Users deserve some credit for the level of quality. When we estimate that it will take two people nne year to complete a project, they ask the same two people to do it in six months.

Half way through the project, one person (half of the team) is reassigned to another "priority" project. Just before scheduled implementation, a major system modification is requested.

What can I look forward to in my second decade? Is there a light at the end of the tunnel?

A You have made an excellent point. For any given project, a change in quality, scope, resources or schedule will inevitably invoke a change in one or several of the others.

As you've indicated, quality is usually forsaken for changes in schedule, resources and scope. There is no reason why those involved can't be made aware of the impact of their decisions.

User awareness may be the light at the end of the tunnel.

Q We've decided to collect all manuals and documentation and centralize them in a DP library. I promoted one of my operators to DP librarian. She will continue to report to me.

Neither of us knows very much about how to set up such a library and thought you might be able to provide some guidance:

A I'm assuming you already have or don't need a tape/disk librarian or an education librarian, so I'll direct my comments to the "DP librarian." (Information resources librarian might be a title more indicative of the function.)

I would recommend that you expand your concept of the DP library

Turnaround Time
By Larry E[illegible]

to encompass DP/management information systems books, relevant trade journals and periodicals and specialized materials obtained from seminars, conferences and vendors. These items are in addition to technical manuals, systems and program documentation and master copies of operational and user manuals.

The librarian will be involved in all of the traditional library functions of acquisitions, cataloging, circulation and reference. Acquisitions should just be an administrative function. Give the acquisitions budget to a library committee that is charged with the selection of books and periodicals. Such a committee ensures that available funds are spent on needed material.

The librarian should provide reference service on an ad hoc and ongoing basis. A good librarian scans material as it comes in and alerts key people to articles and books pertinent to their job functions.

The person in charge of circulation control, the information resources librarian, should also be assigned responsibility for change control of systems and programming documentation.

The importance of the information resources library cannot be overstated. To put this into perspective, try finding this issue of *Computerworld* three weeks from now.

Q I am about to embark on a project to install remote CRT terminals, printers and scanning devices in a rural school district. The local telephone company is well known for having many problems providing secure, reliable service. Do you have any suggestions that might help me ensure a reliable network throughout the school district?

A The local telephone company is probably the only economically feasible alternative. Its service level can probably be attributed to equipment that represents the technology of 20 to 40 years ago. Hundreds of other rural cities are plagued with the same dilemma.

In defense of Bell and other sister organizations, these switching stations were designed for voice, not data communications. You might say that "this is the age of information, why not upgrade these facilities?" Bell has already thought of that, but has deemed the upgrade of many rural facilities not yet cost-effective, service level notwithstanding.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*

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Business System Answers Church's Prayers

LOUISVILLE, Ky. — Ever feel the only solution to your problems was prayer? The Rev. John Russell took that approach and wound up with a small business system.

No, it didn't come from a burning bush; it came from IBM. But the system, Russell recalled, cleaned up accounting and payroll at the Beth Haven Baptist Church and Christian School here.

"I never thought I'd be at a church that had a computer," Russell said, adding that the church shopped for two years before deciding to buy an IBM System/23 Datamaster.

For a year and a half, Russell had earmarked a small office in the church for the processor. "For 18 months, the key to that office was marked 'computer room,'" Russell added.

The 1,500-member church and 500-student school, located in southwestern Louisville, installed a Datamaster with 64K bytes of main memory and IBM's Brads III software, a program product that sets the environment for applications to be custom developed, Russell said.

Application Programs

Application programs were developed by church members with programming experience, Russell recalled, and a payroll package was the first to be put on the system.

"It really simplifies payday," Russell noted, adding that the payroll, which used to take about four hours to process manually, is now done in about 45 minutes.

Church membership records are also being put on the system, including basic census information such as the family name, address, size of the family, birthdays, attendance and contributions.

The processor can also be used to determine which parishioners are enrolled in Sunday school classes, Russell said.

"If we want a class printout, we can separate them out in a jiffy," Russell said, adding that the processor has also cut the time it takes to prepare mailing labels.

The church contribution record, now being developed, is expected to be a boon to both the church and its members. Russell explained the church will be able to send out monthly reports to members that will show how much parishioners have given for the month and year to date.

Russell added that the availability of those records usually enhances fund raising and provides tax information for parishioners.

Other planned applications for the processor include scheduling school and church bus routes and adapting general ledger, accounts receivable and accounts payable for school, as well as church functions, Russell said.

Course Offers Free Software

SANTA MONICA, Calif. — Integrated Computer Systems is offering a complimentary take-home graphics software package to participants in its 1983 computer graphics course.

The four-day course entitled "Computer Graphics" is slated to take place twice in Washington, D.C., March 15-18 and June 7-10; Boston, April 5-8; San Diego, April 26-29; Philadelphia, May 10-13; and in San Francisco, June 14-17.

The course costs $845. Further details are available from Integrated Computer Systems at 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

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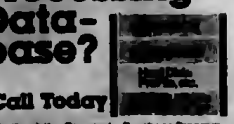

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To Learn About High Tech's Impact

State Legislators Go to Computer Day Camp

By Hal Glatzer
Special to CW‡

OLYMPIA, Wash. — State legislators went to "computer camp" for a day and came back with what many business people have been getting on their own: a sense of what information processing technology can do for them.

Sixteen Washington state representatives, 12 senators and more than 30 of their staff got hands-on experience with computer systems at The Evergreen State College. The systems included a University of Washington retrieval system for census and data bases, the Control Data Corp. Plato instructional system and the state's own mainframe-based Legislative Information System. They also saw a University of Florida program that models the fiscal impact of land-use planning decisions on communities — a program that runs on an Apple Computer, Inc. Apple microcomputer.

It was called "computer camp" out of whimsy, but the legislators and their aides heard serious presentations that raised tough issues, including rights to privacy, displacement of blue-collar workers by robots and the social changes that would have to be made to attract high-technology industries to Washington.

Computerized Future

John Aiken, director of computer services at Evergreen, painted a less-than-rosy picture of a computerized future. "Computers allow people to delegate decision making to machines, but what, exactly, should we delegate, and can we delegate too much?" he wondered aloud. "Computers are so literal. We have to be sure that we want them to do what we tell them to do," he said.

"Is it possible to legislate against computer abuse?" asked a senator. "Is it possible to legislate against *any* kind of behavior?" Aiken countered. "It is not possible to prevent all abuses, but we could prevent certain systemwide abuses."

A more upbeat note was sounded by the keynote luncheon speaker, Jonathan V. Post, a software specialist with the Boeing Aerospace Co. in Seattle. Post, who has written both scientific papers and science fiction, urged the legislators to ensure that Washington's schools get computers. By installing them in schools, Post said, the state will gain in having more "computer-literate" people who will stay in Washington to work.

He recommended that the state offer incentives to business to supply computers to the schools: easier debt financing, depreciation allowances, one-time incentives for "modernization" and seeking help from federal agencies for funds.

He cited the example of North Carolina, which now counts high technology as its "number four" industry. "The governor went to companies and said, in effect, 'As soon as you break ground for a new plant, we will start to train people at state-supported schools; as soon as you open your plant, we will have your people ready.'" According to Post, software will be the area of greatest growth through the rest of this century. Software companies tend to be small, labor-intensive businesses, which Post said can generate jobs up to 13 times faster than large companies can.

Post warned, however, that the key to attracting high-technology business is to have an educational system committed to it — and that the biggest problem would be finding teachers — who can presently make much higher wages working for industry than they could teaching school.

He suggested that the state ask local companies to subsidize teachers' salaries, to offer them summer jobs, or — alternatively — to lend tuition money to undergraduates who want to go into teaching and forgive the loans if they do so. "We need to make the job of a science teacher more attractive," he said.

Tom Bennett, director of the University of Washington's Computer Center, explained how computers work and took the legislators through a step-by-step understanding of how a user gets "reports" from a computer. The most potentially useful software for the lawmakers, he said, would be data base management.

The computer camp was sponsored by the bicameral Science and Technology Committee and organized by Rep. Ray Isaacson, a chemical and nuclear scientist who represents the Hanford area and has worked on its nuclear reactor projects since 1951. Isaacson said, "We're moving into a more technological lifestyle and legislators have to understand it. If you don't understand it, it intimidates you.

"For example," Isaacson said, "we have a Legislative Information System that gives us the latest versions of bills; there are terminals spotted in every caucus room. But most legislators don't use it themselves — they have their staff do it. They haven't realized yet that once you sit at the console and learn to address the machine, it's easy. The problem is breaking the ice."

Glatzer is a free-lance journalist based in Seattle.

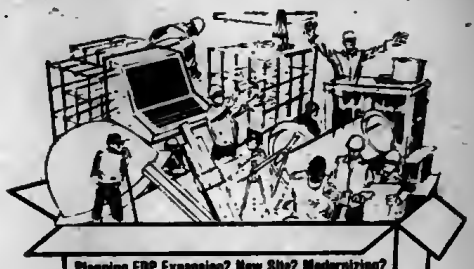
Micro Newsletter to Debut

NEW YORK — The initial issue of a new monthly newsletter edited for business users of microcomputers, "Microcomputer Software Letter," will be published this month.

Its contents will cover four basic areas each month: important trends and user tips to enhance productivity; a review of the top five or six software packages in each major business area, such as word processing, spreadsheets and others; a summary of important articles appearing in 45 publications that cover the micro area; and a listing of resources important to business users, such as training packages, seminars, directories and catalogs.

The subscription cost is $124.49 per year.

Further information is available from "Microcomputer Software Letter" at Suite 706, 610 Fifth Ave., New York, N.Y. 10020.



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Software-Rehab Plan Advised: Consultant

By Jeffry Beeler
CW West Coast Bureau

DANVILLE, Calif. — Corporate computing departments could "easily" trim their programming budgets by 50% if they would only formulate a "software-rehabilitation" plan, conduct structured walk-throughs and standardize both their program specifications and program modules, according to DP consultant Gopal Kapur.

Although all three suggested budgetary remedies are simple, effective and relatively inexpensive, none of the measures has yet found its way into widespread practice, the founder of Kapur & Associates, Inc. said here during a recent phone interview.

Kapur based his conclusion on the results of his own company's recent survey of 151 medium- and large-scale businesses throughout the U.S. Begun in June 1981 and completed only about two months ago, the survey uncovered evidence of extensive "complacency" among systems professionals and an unwillingness to come to grips with the computing field's true problems, he said.

When the participating companies were asked whether they had instituted a formal plan to rehabilitate their existing software, only six of the survey respondents replied affirmatively. All but 41 of the firms admitted having failed to develop standards for their program specifications, and only slightly more than a fifth of the respondents claimed to have standardized their program modules or prototypes.

Most of the companies that have reportedly standardized their program modules have done so only for their system software, not for their applications, where the vast majority of logic errors occur, the consultant said.

To Kapur, the survey results point out that computing professionals are doing little if anything to boost programmer productivity and relieve their crushing backlog of unfinished epplications.

"Everybody complains about the problems currently facing our industry," he said, "but all that most people are doing to solve those problems is to wait around for new technology. Almost no one is trying to find out where the solutions to our current difficulties truly lie."

To accelerate system development and satisfy rapidly growing user demand for new applications, computing departments should adopt a three-point action plan consisting of a software-rehabilitation effort, walk-throughs and standardization of program specifications and modules, Kapur said.

Businesses that have successfully rehabilitated their existing epplication software have typically reported a 50% reduction in their overall system design and coding times, he added. The standardization of program specs and modules, meanwhile, can further streamline a company's programming effort by 10% to 30% and 25% to 50%, respectively, with walk-throughs accounting for an additional 10% to 15% increase in efficiency.

For a system consisting of 100 programs, a typical software-rehabilitation effort can take anywhere from six months to a year to complete, but the results easily justify the time and expense. In addition to speeding software design and coding, a rehabilitation plan can raise programmer morale and trim employee turnover.

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Spec Standards Another Tool

Software rehabilitation, if done successfully, can perform the indispensable service of eliminating many of the problems that cause application programs to go bad in the first place.

"If companies neglect to have their software rehabilitated, all the industry's talk [of boosting programmer productivity and cutting application backlogs] will be a moot point," DP consultant Gopal Kapur said.

As a further aid to programming efficiency, corporate computing departments would be well advised to make sure that their program specifications conform to certain in-house standards, the consultant added. The main benefit of standardized specifications is that they help programmers decide at the outset what data needs to be included in e given program.

Kapur's years of experience as a DP consultant have convinced him that much of the information in original program specifications is often either ambiguous or omitted altogether — a failing that frequently results in bugs.

"Most specifications leave out a very important piece of information — e statement of exactly what a program is supposed to do and why," Kapur said. "That and other necessary information eventually gets discovered and is included in a program, but unfortunately it is often not discovered until the end."

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Robotics Awards Set for April

DEARBORN, Mich. — The Robot Institute of America (RIA) annual awards will be presented in Chicago April 19 in conjunction with the 13th International Symposium on Industrial Robots/Robots 7 Conference and Exposition.

The Joseph F. Engelberger Award will be awarded in the following three categories: technology development, application and education. Each of the three awards includes a commemorative medallion and a $1,000 honorarium.

Submission of nominations will be accepted until Feb. 23. Nominations brochures are available from Paul von Jankowsky, PR/Promotions Administrator, Robot Insitute of America, 1 SME Drive, P.O. Box 930, Dearborn, Mich. 48128.

Zenith Data Offers Software Directory

GLENVIEW, Ill. — A directory listing over 400 software programs for Zenith Data Systems, Inc.'s Z89 and Z90 microcomputers has been compiled by Zenith.

The directory includes packages for accounting, agribusiness, communications, computer languages, data base managers, education, engineering, entertainment, financial, graphics and word processing.

It costs $25 from 1000 Milwaukee Ave., Glenview, Ill. 60025.

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Copyright Act Codifies Employment Agreements

By Daniel T. Brooks
Special to CW‡

A vital activity in most organizations is the development, installation, maintenance and enhancement of computer programs and subroutines. DP departments call on their internal staff, consultants and other independent contractors for these activities. They also turn more frequently to packages acquired or licensed from third-party vendors to meet their needs.

The Copyright Act of 1976, which is effective as to programs and subroutines written on and after Jan. 1, 1978, codifies several concepts that complicate employment agreements, consulting agreements and software licenses.

First, copyright is now automatic in most computer programs. At many stages of program development, an expression of the program is "fixed in a tangible medium" from which it can be "perceived, reproduced or otherwise communicated for a period of more than transitory duration." This can be on coding sheets, on terminals, on tape or disk storage media. At the first instant of being so fixed, copyright in that expression automatically "subsists."

Ownership of the copyright may be critical. Under the new Copyright Act, copyright automatically subsists in several versions of most programs, regardless of whether authors or their employers wish it. Since individuals write programs, but their employers expect ownership, questions of copyright ownership become critical.

The General Rule

The general rule is that the actual author owns the work. Copyright can only be acquired by employers or other persons if it is transferred by the author. This generally takes place by operation of law under the "works made for hire" doctrine. In other cases, agreements or licenses are required.

A writing is mandatory for a transfer of copyright (or any exclusive right) other than by operation of law. Recording of the transfer at the Copyright Office is a precondition to suit for infringement and advisable to cut off potentially superior rights of later transferees, should the author sell the program more than once.

Those who take copyrights by transfer should be aware that transfers from individual authors cannot be for the full term of copyright. For a period of five years following 35 years after the grant, authors have a nonwaivable right to reclaim copyrights in their works.

Employers and consultants may

(Continued on Page 26)

Joint Authors Hold Copyright

WASHINGTON, D.C. — More than one author can hold copyright to one program.

The program is a joint work if the authors intend at the time of writing that the separate portions be merged into a single work. A compilation consists of a "collection and assembling of preexisting materials."

Depending on the authors' intentions at the time of writing, works of multiple authors may result in: many owners of the copyright in the single, but a jointly owned, application package; or separately copyrighted contributions to the application package in which a compilation copyright in the aggregate may lie elsewhere.

Under the "works made for hire" doctrine, the employer automatically becomes the "author" for purposes of the Copyright Act of 1976. Employers and employees must expressly agree "otherwise in a written instrument" to change the statutory result. Prior decisions under this statute section are still relevant. But copyright is now automatic. Drafts, working papers and other documents essential to the operation of many enterprises are now copyrighted. As a result, each case must be cautiously analyzed.

Where multiple consultants and employees have a common employer, the "works made for hire" doctrine simplifies matters by usually creating a single author, the common employer. Works made for hire come about in two ways. The first is works by employees acting within the scope of their employment. Although the statute requires employees to seek written agreements to alter the statutory presumption, employers may find that written agreements with employees are very desirable. They can clarify the "scope of employment" and make appropriate provision for works arguably outside that scope. They also can address corresponding trade-secret ownership issues.

For example, employees expressly hired to write specific programs may have great ideas or insights at home or over the weekend. They may reduce these to tangible form in similar off-hour circumstances. At that instant, copyright subsists.

Another case is specially commissioned works that may become "works made for hire . . . if the parties expressly (so) agree in a written instrument." Consultants and suppliers will not be employees within the scope of their employment. Thus, the automatic copyrights in programs and subroutines prepared by consultants and suppliers are the property of the employer/user only if there is a writing under which they are either within the specially commissioned "works made for hire" section or conveyed or exclusively licensed.

Only those works commissioned as a contribution to a collective work, as a translation, supplementary work, compilation or an instruction text qualify. Any of these could become "works made for hire" under an appropriate written agreement. This category does not include joint works and derivative works.

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Codd Featured at Data Base Management Meet

LYNNFIELD, Mass. — The 1983 National Data Base Management Symposium, which will be held in three cities this spring, will feature presentations by three guest lecturers, including Dr. Edgar Codd of IBM.

The symposium will be held March 1-4 in Los Angeles, April 18-21 in Washington, D.C. and May 16-19 in Chicago. It will focus on new and enhanced data base and data management products that run on mainframes, minicomputers and microcomputers, according to its organizers.

Codd will present a paper on "Future Directions in Data Base Management." Charles Bachman, vice-president of Cullinane Database Systems, Inc., will speak on "Data Management Systems, Past, Present and Future." Thomas M. Nies, president of Cincom Systems, Inc., will focus his presentation on "DBMS Requirements for the Information Center Environment."

George Schussel, president of Digital Consulting Associates and chairman of the symposium, will address the topic, "1983 to 1988, The Hardware and Software Environment."

Conference registration is $650 for all four days or $350 for the seminar day only (first day). This fee includes lunches and materials. Group discounts and further details are available from Digital Consulting Associates, 5 Kimberly Terrace, Lynnfield, Mass. 01940.

Copyright Act Codifies Work Pacts

(Continued from Page 25)

own the copyright. When users pay consultants or independent software organizations on a "cost-plus" or even "time-and-materials" basis to prepare programs, there is a clear basis for the users to seek copyright ownership. The authors took little development risk in the transactions. Authors' rights to reuse their work should involve royalties to the risk-bearing developer/user.

On the other hand, user-ownership of copyright in minor patches to preexisting packages, no matter what the agreed price, is almost never appropriate. The supplier's future right to modify the package and the license to patches to others is at stake.

The trick for users, suppliers and employers alike is to distinguish "cost-plus, custom-built" situations from "below-cost incidental" situations (and all the grey areas in between) and to reach agreement properly on copyright ownership. Failure to do so will usually leave suppliers and users in jeopardy.

The clear title is a clear title to the copyright. Ownership of a particular copy is a separate matter. Owners of copies have certain statutory rights, such as to sell the copies and to display them publicly. Thus, traditional license restrictions on users copying, modifying or reselling programs do not seem to work if the licensees own the copies.

Unfortunately, for consultants and suppliers, the circumstances surrounding delivery of software to most end users frequently are tantamount to sales of the copies to the users. In short, most program licenses are economically the equivalent of sales, at least of the copies. Fortunately for vendors, it does not follow from mere sales of copies that the vendors' copyrights have been transferred to users. Under the Copyright Act, sales of copies are not sales of copyrights and vice versa.

Brooks is an attorney whose firm, Computer Law Advisers in Springfield, Va., specializes in computer law. He also is chairman of the Commission on Software in the '80s.

Usus Names Chairman

DALLAS — Randy Bush of Volition Systems, Del Mar, Calif., was recently elected chairman of the University of California at San Diego (UCSD) Pascal System User's Society (Usus) at the group's national meeting, held here last month.

Also, Usus formed four new special-interest groups for users of IBM Personal Computers, Texas Instruments, Inc. computers, Sage Software Products, Inc. products, according to group spokesman.

The next scheduled meeting of Usus is April 22-24 in San Diego. Further details are available from Usus headquarters through P.O. Box 1148, La Jolla, Calif. 92038.

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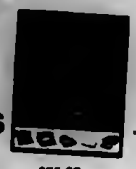

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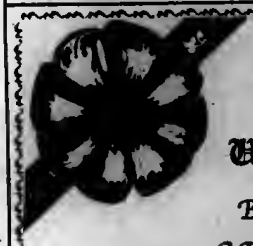

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Award Nominations Sought

CHICAGO — Nominations are being sought for the Library and Information Technology Association (Lita)/Gaylord Award for Achievement in Library and Information Technology.

The award recognizes leadership, notable development or application of technology, superior accomplishments in research or education or original contributions to the literature of the field of information processing.

Any individual or small group of individuals working in collaboration are eligible to receive the award.

A monetary stipend of $1,000, plus the award, will be provided to the winner.

Nominations may be made by any member of the American Library Association and should be submitted by Feb. 1, 1983 to Mary Fisher Ghikas, Lita Awards Committee Chair, Chicago Public Library, 425 N. Michigan Ave., Chicago, Ill. 60611.

Bell Labs Offers Videotapes To Acquaint Students, Unix

NEW YORK — Bell Laboratories has produced two videotapes to familiarize students and others with the firm's Unix operating system.

"The Unix System: Making Computers Easier to Use" reportedly gives an overview of the system, traces its development and demonstrates its uses. The 23-minute tape was designed for students with an interest in engineering, math, computer science or other sciences.

"The Unix System: Making Computers More Productive" gives a more detailed discussion of the system and its applications. The 28-minute tape is aimed at computer science majors and corporate trainees.

Tapes in ¾-in. U-Matic, VHS and Beta cassettes cost $100 each. They are also available in ¾-in. Pal and Secam cassettes at $140 each from John Francis, MGS Services, Inc., 619 W. 54th St., New York, N.Y. 10019.

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Firm Speeds Delivery Time With Order Entry

STERLING, Ill. — Considered and careful planning by the management at National Manufacturing Co., a manufacturer of builders' hardware products based here, has resulted in 80 years of continued corporate growth.

The same planning, plus a steady upgrading of hardware and software, has also helped the firm's data processing operation keep in step with state-of-the-art developments in the computer industry, according to Mike Dolan, National Manufacturing's director of information services.

The firm currently employs 600 people and has a total of 54 terminals in the executive offices, data processing, product control packaging, warehouse and payroll. The terminals are linked to an IBM 4341 computer, which handles an average age of 30,000 separate transactions daily.

Computer support is an integral part of operations at National, where a wide range of products is manufactured. The company's closed-loop computer system has merged functions such as customer service, financial projection and material requirements. This maximizes the use of the firm's physical, personnel and financial resources, according to Dolan.

The company maintains a sales force of more than 100 people covering the U.S., including Hawaii, Alaska and Puerto Rico. Primary distribution emphasis is placed on shipment to retail hardware dealers in these areas.

Typically, orders accumulated during the day are phoned in by salesmen in the evening. Each order, consisting of 40 to 50 separate line items, is received by an IBM System/7 minicomputer. The order is "fed across" to the 4341, Dolan said.

At this point, the on-line order entry system takes over performing all appropriate editing and credit checking. Then it automatically releases the orders, which are boxed and sent to the warehouse loading docks for shipment.

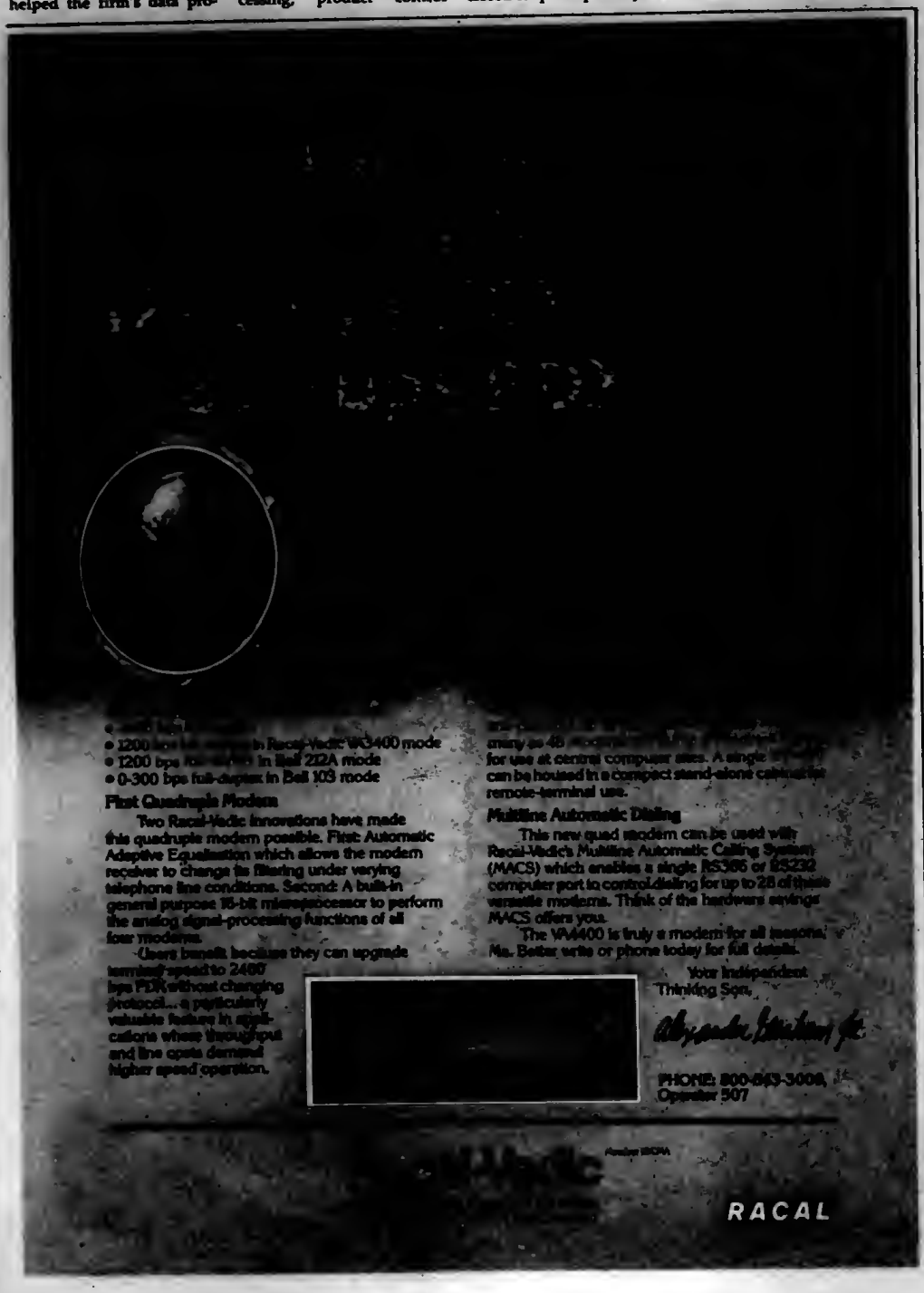
Cycle Time Cut

Dolan noted that the order entry system has drastically cut the company's average order cycle — the time between a customer's placement of an order and the time the goods to fill it could be expected on the loading dock. Now, 85% of all orders are ready for shipment within three days, he said.

This means, Dolan added, that of a salesman's orders acquired on Monday and phoned in Monday night, 50% would be ready to be shipped on Tuesday and another 35% on Wednesday.

Customer servicing has also been enhanced by a material requirements planning system, which has resulted in National's ability to provide, also within a three-day time frame, a 99% line-item fill. This means that National is able to satisfy 99 out of every 100 line items in the orders it processes with the appropriate finished products.

Top-line executives routinely use their own terminals for a variety of purposes. The Planning, Control and Decision Evaluation System (Plancode), an IBM program, was implemented almost two years ago.



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Eatery Cooks With Microcomputer Register Net

MOBILE, Ala. — The Studebaker's restaurant chain owned by Yesterday's, Inc. has become more profitable, gained valuable expansion information and made waitressing easier with a microcomputer/electronic cash register network.

Yesterday's recently purchased four Victor Business Products, Inc. Vanguard electronic cash registers and a Victor 9000 desktop business computer, which is linked to a mainframe at the home office here.

Each electronic cash register, both behind the bars and at various stations around the lounge, provides continuous reports on gross, net and total sales, average sales by department and media reports (cash, credit card and house charge).

Tracking Productivity

In addition, the network is able to track productivity by restaurant, department, station, drink, brand of drink, hour and individual staff member on a continuous and immediate basis.

With this information, Studebaker's can adjust its operation on a daily basis to increase profitability. Gene Gunn, the chain's manager of operations, pointed out they constantly redesign the floor plans and alter the number and location of stations, based upon the data they receive on the pattern of sales by time and place.

The system also provides information that is especially important in enabling the chain to expand to their next sites in Houston, Dallas and Atlanta. Through the interaction of the cash registers at all the chain's outlets with the Model 9000 at the home office, the key executives of the organization have immediate knowledge of how well each branch is doing, Gunn said.

The Model 9000 enables the accounting function for the entire chain — including payroll, inventory by location, general ledger and accounts payable and receivable — to be centralized in the Mobile office.

From the point of view of the individual waitress, the system provides a unique dollar subtotal function, which, together with the balance-forward key, allows her to keep running subtotals of all individual tabs throughout the evening. This kind of "programmability" avoids much of the tab-keeping complications that can eventually lead to errors and lapses in security in food-and-drink service settings, according to Gunn.

The other features of the system that appealed to Gunn were its durability and simplicity of operation.

"Our restaurants are high-volume operations," he stated. "We give these machines a pounding, and they hold up. They are easy to instruct our waitresses and bartenders to use, which makes dealing with changes of staff much less disruptive to our operation and efficient in terms of both time and expense."

Yesterday's plans to open a Studebaker's restaurant every six weeks for the next year.

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Agency Uses Protocol Converters to Save $53,000

ST. LOUIS — The Farmers Home Administration (FMHA) here saved $53,000 when it used protocol converters to interface 25 Lear-Siegler, Inc. Model 42 Ascii terminals to its IBM 370/168 in Kansas City, Mo.

What the Accounting System Conversion and Enhancement Development Division of the FMHA ended up with was concentrator/controllers that cost $53,000 less than buying IBM 3270-type terminals with associated cluster controllers, according to John Owens, an FMHA computer analyst.

The "Little Black Box" Model C-80 from M/A-COM Alanthus Data, Inc. now provides the 3270-type and Ascii-terminal interface to the 370/168 in Kansas City.

As a terminal controller, the C-80 provides TTY-to-3270 protocol conversion, makes dial access to 3270-class applications easy and, in a cluster environment, offers a built-in RS-422 option.

It "recognizes" over 30 major terminal device types and provides remote support.

Central Support

The Accounting System Conversion and Enhancement Development Division supports the central banking facility for a portfolio of 1.7 million individual loans made to farm families, rural industry and rural communities and their residents in the U.S. and its possessions.

Its IBM 370/168 is time-shared with other government agencies, including the Agricultural Stabilization and Conservation Service and the Federal Crop Insurance Corp.

"As FMHA programs really expanded, the original manual methods, which included keeping tens of thousands of loan files in tubs and a monumental pen-and-pencil effort by two- or three-dozen employees had to be discarded because the accounting group was overwhelmed," Owens stated.

By 1974, a Burroughs Corp. B4700 had replaced earlier Burroughs computers. Meanwhile, the continuous increase in loans accompanied by the ever-increasing assignments of new programs, which were different from those undertaken by the U.S. Department of Agriculture, of which FMHA is an agency, created a critical stage.

There was no question that the FMHA had to have access to a large, powerful processor. Yet a feasibility study conducted had shown that Kansas City would be a better place to locate it. As a result, the 370/168 was installed there in 1981.

This led to the creation of another substantial problem for the division — how best to communicate with the remote CPU. A procurement effort resulted in a competitive award to Four-Phase Systems, Inc. for 3270-type terminals for key-to-disk data entry and remote batch operations.

"It was not long before two basic problems arose," said Larry Miller, acting director of the division. "The technology for 3270-type operations changed and there were not enough 3270s in our inventory to satisfy the entire network requirements."

He requested that exploration for a less costly alternative be undertaken. That exploration led to use of the Lear-Siegler Model 42s and the protocol converters.

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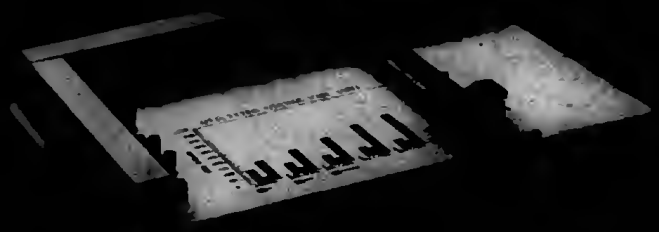

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Managers on the Move

HOLLAND M. SMITH II has been appointed director of management information systems (MIS) for Ametek Corp., Straza Division, a manufacturer of jet aircraft engine assemblies, in El Cajon, Calif. He is responsible for the installation of a new computer system and directing the implementation of a centralized manufacturing information and control system.

He was previously project manager for manufacturing systems development at Emerson Industrial Controls in Santa Ana, Calif. Before that he was DP audit administrator for Rohr Industries, Inc.

A member of the Data Processing Management Association (DPMA), Smith recently earned his Certificate in Data Processing this year. He has an A.A. degree in data processing from Coleman College and an M.S. degree in marketing from San Diego State University.

• • •

GARY G. STONE and DAN R. TAYLOR have joined the corporate DP department at Ball Corp., in Muncie, Ind.

Stone, as manager of systems and programming for corporate staff functions, will work principally with Ball's controller's office, the employee relations department and corporate treasury.

Stone is a graduate of Purdue University, with a B.S. degree in computer technology. in addition, he has studied industrial systems at Indiana University-Purdue University at Indianapolis.

Taylor will serve in the newly created position of manager of data processing research and technical services. He will be responsible for the support of operating systems and data base management, as well as researching new DP technologies and techniques that may benefit the company.

Before joining Ball Corp., Taylor had been with international Harvester Co. in Fort Wayne, Ind. since 1971. His most recent assignment there was manager of systems for the company's trust group. He graduated from Tri-State University with a B.S. in accounting and a B.A. in business education. He also studied computer science at American University.

• • •

GERALD P. MEIER has accepted the position of corporate director of MIS with the Angelica Uniform Group, a division of Angelica Corp. based in St. Louis, which manufactures and markets uniforms for health care institutions.

Meier is on the board of directors for the St. Louis chapter of the DPMA.

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Publisher Licks Mail Woes

WILMINGTON, Mass. — Sam Blum's mailing list was bringing him down.

Blum is the publisher of *Typeworld*, a triweekly word processing, typesetting and graphics communications newspaper with a circulation of 55,000. He and his wife, Sylvia, nurtured the tabloid from their home here in Wilmington and recounted their struggle with their burgeoning mailing list.

"When we first started, the list was produced by a private service bureau. They did our list maintenance and provided us with mailing labels. But it wasn't cheap and they made far too many errors," he explained.

His wife continued: "I had to write out every change with the ID number of the account and the change of address. The changes would then be passed on to the service bureau.

"Too frequently they would indicate they had made the change, though they hadn't. I knew they hadn't because it was part of my job to review the new list every month," she lamented.

Now, with an IBM Series/1 with 69M-byte disk storage, she keys in a change and the computer stores it until her husband is ready to print labels. "Now I can make changes every day," she said.

"With the computer," Sam Blum said, "if there are any mistakes on the list we've made them. And now there's no lag time. If I need labels tomorrow morning, I'll do them tonight."

The computer's printer can print about 10,000 labels per hour, which allows Blum to print labels for each issue of *Typeworld* in about five hours.

He emphasized the importance of his mailing list efficiency: "The mailing list is our lifeline — our prime asset."

He added, however, that in addition to streamlining mailing list operations, the Series/1 has enabled him to do market research and analysis and run an efficient list rental service.

"It's another payoff of the computer," he said.

In conclusion, Blum said, "I figure a payback time of about three years. Plus it's given us faster turnaround time, better control and it's allowing us to handle the Zip-plus-four — the new 9-digit mailing code."

Sam and Sylvia Blum use an IBM Series/1 minicomputer in their home to handle the administrative duties of their triweekly word processing, typesetting and graphics communications newspaper.

Three-Day Seminar Series On Unix Set for January

ORANGE, Calif. — The Center for Advanced Professional Education (Cape) is offering a series of three-day seminars in January to introduce DP professionals to Bell Laboratories' Unix operating system.

The seminars discuss Unix in the context of traditional operating systems, then examine it from the inside out, according to a Cape spokesman. Included are a detailed description of the system "kernel," a discussion of standard user-level programs and commands for file manipulation, word processing and programming, the spokesman said.

The pros and cons of Unix for specific applications reportedly are treated from the perspective of the course director's experience as implementer and user. The course director is Marc J. Rochkind, vice-president of Emerging Technology Consultants, Inc., a Colorado-based firm specializing in end-user software development. Application areas he will discuss include transaction, data base and real-time processing, data communication and office automation.

The seminar will be held in Boston, Jan. 5-7; Irvine, Calif., Jan. 12-14; Chicago, Jan. 17-19; and Somerset, N.J., Jan. 26-28.

Registration for the Unix seminars costs $595, which includes course workbook and all materials. Further information can be obtained from Cape at 11928 N. Earlham, Orange, Calif. 92669.

ACM to Offer Quarterlies

NEW YORK, N.Y. — The Association for Computing Machinery (ACM) has announced the publication of two quarterlies, *ACM Transactions on Office Information Systems* (Toois) and *Transactions on Computer Systems*.

Toois is planned as the focus of major work, from formal presentations to special reports, on the design, implementation and evaluation of office information systems.

It will be available in January, 1983 and will cost $20 for ACM members and $70 for nonmembers.

John Limb of Bell Laboratories has been selected as editor-in-chief of Toois. Authors should send their article submissions to Limb at Bell Labs, 600 Mountain Ave., Murray Hill, N.J. 07974.

Transactions on Computer Systems will focus on the related areas of computer architecture, operating and distributed systems and networks, including their design and function.

The publication will be available in February and cost $20 for ACM members and $70 for nonmembers.

Anita K. Jones, associate professor of computer science at Carnegie-Mellon University has been appointed editor-in-chief. Papers should be submitted to Jones at Tartan Laboratories, 477 Melwood Ave., Pittsburgh, Pa. 15213.

Second Issue Of 'Pragma' Out

APTOS, Calif. — The second issue of a 48-page software journal titled *Pragma* has been issued. It is written for users of Microdata Corp., Ultimate Corp., Evolution Computer Systems Corp., IBM Series/1 and other computer systems.

The publication is dedicated to publishing working systems and applications software.

A one-year subscription costs $100, but a free copy of the first issue is available from *Pragma* at 207 Granada Drive, Aptos, Calif. 95003.

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DOS/VSE Library and VSAM Catalog Display
BIMSERV
Displays directories and entries in all DOS/VSE libraries, VSAM Catalog, Label Area, and VTOC's (CICS). $1450 or $74/mo

Word Processing System
BIMTEXT
Create formatted documents from free-form input. Margin justification, numerous other formatting options, permit document changes without retyping other text. $2400 or $120/mo.

DOS/VS(E) Console Hard Copy File Display
BIMDSLOG
Used by operators or programmers to review DOS/VS messages via CICS or SHADOW without tying up system console. $720 or $36/mo.

DOS/VS(E) System Status Hard Copy Display
BIMMONTR
The original and still best DOS/VS(E) system activity, POWER/VS queue, and POWER/VS job output display system (CICS). Numerous options to assist operators and programmers. $920 or $46/mo.

DOS/VS(E) Device Assignment Status
BIMDEVC
Displays logical unit assignments to devices (CICS). $360 or $18/mo

DOS/VS(E) Job Submission Editing
BIMSUBMIT
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[illegible]

Calendar

Week of Jan. 2

Jan. 3-7, New York — **CICS Macro-Level Programming.** Contact: David Shapiro, Sys-Ed, One Park Ave., New York, N.Y. 10016.

Jan. 5, Columbus, Ohio — **Vsam Introduction.** Contact: Education Coordinator, Goal Systems International, 5455 N. High St., Columbus, Ohio 43214.

Jan. 5-7, Atlanta — **Local-Area Networks.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

Jan. 5-7, Boston — **Unix.** Contact: Center for Advanced Professional Education, Inc., 11928 N. Earlham, Orange, Calif. 92669.

Jan. 6-7, Columbus, Ohio - **Vsam Performance and Tuning.** Contact: Education Coordinator, Goal Systems International, 5455 N. High St., Columbus, Ohio 43214.

Jan. 6-7, Boston — **Implementing Personal Computers in the Corporate Environment.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held Jan. 6-7 in San Francisco.

Week of Jan. 9

Jan. 10-11, Boston — **X.25 and Related Packet Network Protocols.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

Jan. 10-14, Lincoln, R.I. — **Data Management-IV TP.** Contact: D.P.S., Inc., Suite 400, 10 Langley Road, Langley Executive Building, Newton, Mass. 02159.

Jan. 11-13, Atlanta — **Data Communications Concepts.** Contact: Memorex, Customer Education, San Tomas at Central Expwy., Santa Clara, Calif. 95052.

Jan. 11-14, Boston — **OS/MVS Advanced JCL.** Contact: Gail C. Ross, Computer Education Services of Boston, Inc., 739 Boylston St., Boston, Mass. 02116.

Jan. 12-14, Boston — **Local-Area Networks.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

Week of Jan. 16

Jan. 17-18, Columbus, Ohio — **DOS/VSE Job Management.** Contact: Education Coordinator, Goal Systems International, 5455 N. High St., Columbus, Ohio 43214.

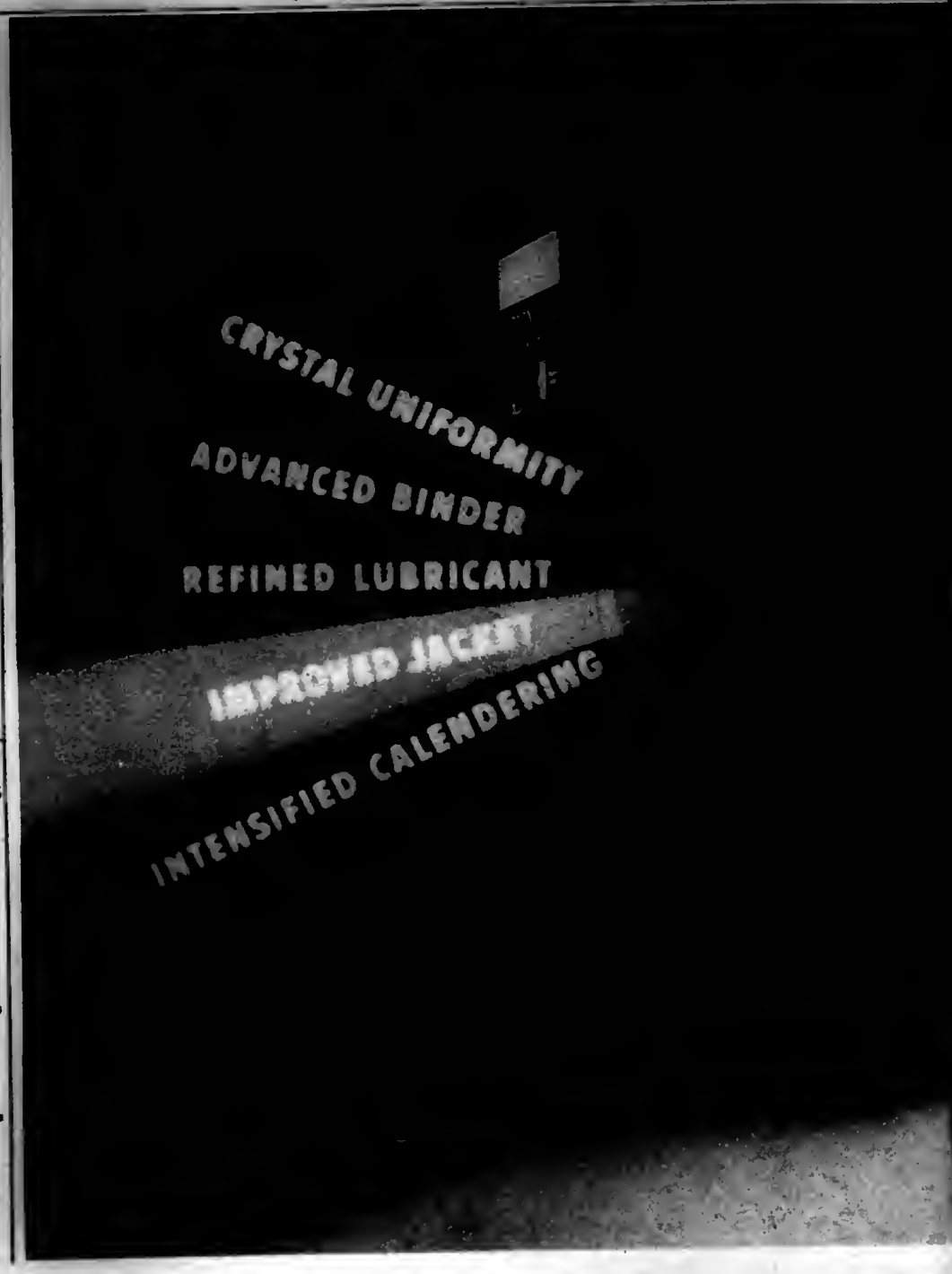
Jan. 17-19, Short Hills, N.J. — **IMS DL/1.** Contact: Chubb Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

Jan. 17-20, Boston — **Vsam: Its Structure; How to Use.** Contact: Gail C. Ross, Computer Education Services of Boston, Inc., 739 Boylston St., Boston, Mass. 02116.

Jan. 17-21, Chicago — **Data Management IV DML IDS/II Program Specifics.** Contact: Kris Osborn, D.P.S., Inc., Suite 400, 10 Langley Road, Executive Building, Newton, Mass. 02159.

Jan. 18, Honolulu — **The Evolution to a Digital World.** Contact: Pacific Telecommunications Council, Suite 303, 1110 University Ave., Honolulu, Hawaii 96826.

Jan. 18, Smithfield, R.I. —



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Time Management. Contact: The Center for Management Development, Bryant College, Smithfield, R.I. 02917.

Jan. 18, Chicago — **Computer Assisted Retrieval Systems.** Contact: Marvin Brooks, National Micrographic Association, c/o Square D Co., Executive Plaza, Palatine, Ill. 60067.

Jan. 18-20, New York — **Stategic Systems Planning Seminar.** Contact: Seminar Coordinator, IMCSI, Suite 1547, 230 Park Ave., New York, N.Y. 10169.

Jan. 18-20, Boston — **Local-Area Networks.** Contact: Digital Equipment Corp., Educational Services, Seminar Programs, 12 Crosby Drive, Bedford, Mass. 01730.

Jan. 18-20, Tallahassee, Fla. — **Microcomputers in Education.** Contact: Sharon Woodruff, Technical Education Research Centers, 8 Eliot St., Cambridge, Mass. 02138.

Jan. 18-21, Columbus, Ohio — **VM Structure, Flow and Tuning.** Contact: Education Coordinator, Goal Systems International, 5455 N. High St., Columbus, Ohio 43214.

Jan. 19-21, Baltimore — **Vsam Performance Workshop.** Contact: Tom Evslin, Solutions, Inc., Box 989, Montpelier, Vt. 05602.

Jan 19-21, San Jose, Calif. — **Local-Area Networks.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

Week of Jan. 23

Jan. 24, Houston — **IBM-MVS Training Seminars.** Contact: Acts Corp., 11910 Gate Way, Austin, Texas 78759.

Jan. 24-25, Orlando, Fla. — **Computing Technology for Non-Computer Professionals.** Contact: EFDPMA Seminars, Department CT, P.O. Box 3608, Torrance, Calif. 90510.

Jan. 24-25, Short Hills, N.J. — **IMS Data Communications.** Contact: Chubb Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

Jan. 24-25, Boston — **Robotics & Artificial Intelligence.** Contact: Technology Transfer Society, P.O. Box 3608, Torrance, Calif. 90510.

Jan. 24-27, Boston — **CICS/Logic and Debugging.** Contact: Gail C. Ross, Computer Education Services of Boston, Inc., 739 Boylston St., Boston, Mass. 02116.

Jan 24-28, Houston — **Structured Systems Design/Structured Requirements Definition Combined Course.** Contact: Jim Highsmith, Ken Orr and Associates, Inc., 1725 Gage Blvd., Topeka, Kan. 66604.

Jan. 24-28, Summit, N.J. — **CICS Command-Level Programming.** Contact: Chubb Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

Jan. 25-26, East Brunswick, N.J. — **Microcomputers for DP Professionals.** Contact: Micro-Ed, 31 Marshall Drive, Edison, N.J. 08817.

Jan. 26-28, Washington, D.C. — **Introduction to Statistical Analysis System.** Contact: Registrar, Applied Technology Associates, Inc., Suite 1418, 1710 Goodridge Drive, McLean, Va. 22102.

Jan. 25-27, Carmel, Calif. — **Integrated Office Systems.** Contact: Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

Jan. 25-27, New York — **Data Communications Concepts.** Contact: Memorex Corp., Customer Education, San Tomas at Central Expwy., Santa Clara, Calif. 95052.

Jan. 27, Scottsdale, Ariz. —**The Economy of VLSI Procurement.** Contact: Loretta J. Mahoney, Suite 700, DM Data, Inc., Scottsdale, Ariz. 85251.

Jan. 27-28, Washington, D.C. — **Future Trend in Broadband Networks: Fiber Optics, Satellites and Cable.** Contact: Phillips Publishing, Inc., Dianne Fontisso, Suite 1200N, 7315 Wisconsin Ave., Bethesda, Md. 20814.

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EDITORIAL

Gear Up for the Fight

Organized crime is "using the computer to support its legitimate and illegitimate activities." Period.

That is the conclusive statement of a Federal Bureau of Investigation spokesman who was asked to describe "the mob's" use of computers in illegal activities. Unfortunately, that is the only statement available, even from other FBI agents closely associated with the bureau's much-publicized computer crime network.

The problem is not that the FBI will not divulge information. Rather, the FBI doesn't really know how extensively computers are used in organized crime circles. Worse, in many cases, the FBI does not seem to understand computers at all.

Meanwhile, many experts are predicting that one of the biggest growth areas in organized crime will be the fraudulent use of computers to tap into national electronic funds transfer networks.

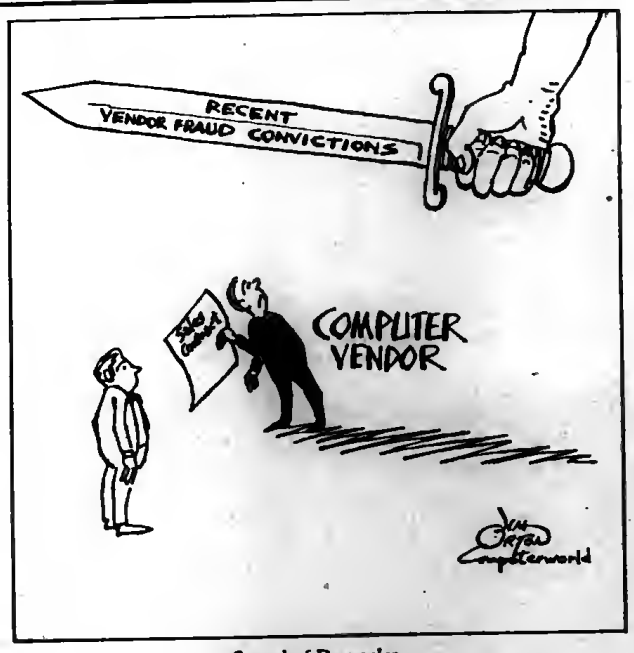
Experts also suspect that the mob is using legitimate businesses and their computers to launder funds from illegal activities. If the experts — with a fraction of the resources of a national law enforcement agency — are alarmed about this activity, why isn't the FBI?

At the FBI Academy in Quantico, Va., only about 200 of the FBI's 7,500 agents have completed the program on computer crime headed up by Supervisory Special Agent John Lewis. Lewis claimed that there is not enough training in computer crime in the FBI. Two years ago, he abandoned his goal of training every agent and is now just trying to train as many as possible under current budget constraints.

While the federal agency is running in place, computers are becoming an integral part of everyday business life and, most likely, of everyday criminal life. While business experts foresee a terminal on every manager's desk, crime experts predict a terminal on every bookie's desk.

The irony is that some areas of the FBI do take computers very seriously. FBI data bases set up in the late 1970s are helping set new records in the investigation and prosecution of organized crime [CW, Nov. 22]. But, as is often true in business, a true understanding of the computer's impact is coming out of the technical services division.

As the business community is recognizing, high technology cannot be restricted to the service-oriented and data processing departments. The FBI must open its eyes to the impending use of computers in all aspects of criminal activity and gear up for the fight.



Sword of Damocles

DATA PAST

Five Years Ago
Dec. 12, 1977

WASHINGTON, D.C. — An industrywide reorganization of basic telecommunications services that could drastically alter the cost for business users' phone service was proposed by a telephone industry task force.

Described as a "conceptual framework," the proposal was sent to the House and Senate subcommittees on communications.

The proposal contained four categories under which all telecommunications services would be provided by existing carriers and their competitors, namely, the specialized carriers.

Ten Years Ago
Dec. 20, 1972

MOUNTAIN VIEW, Calif. — A modem said to reduce line costs by 50% and increase operating efficiency for data users was announced by Vadic Corp.

Capable of operating in full-duplex mode over a single two-wire phone line, the synchronous modem provided four times the data rate of Bell's 103 data set, while it maintained the same line discipline for connect, handshaking and disconnect functions, the company said.

The VA3400 modem could directly replace Bell 202 or equivalent modems, according to a Vadic spokesman.

LETTERS

Documentation Important

I read with interest "Tech Writers Changing 'Retread' Image" and the related sidebars [CW, Nov. 15].

As a tech writer, I found myself in agreement with most of the comments. My professional philosophy is that a tech writer must have good interrogation skills (since engineers sometimes are reluctant to part with information), an ability to "translate" technical jargon into a common language (in our case, English) and the talent to present the "translated" information to readers at all levels.

I was somewhat taken aback, however, by not seeing mention of the Society for Technical Communication (STC), an international organization with the stated purpose of increasing the level of professionalism in technical communications.

STC members are involved in all aspects of technical communication, including formal education and continuing education (on-the-job training programs, seminars and so forth).

All in all, it was an article I was happy to see. I hope it makes top management more aware that documentation is as important to corporate image and profit as the product documented.

John Glenn
Technical Writer
United Technologies/Com Dev
Sarasota, Fla.

The Real Roadblock

I was happy to see technical writing featured in "Tech Writers Changing 'Retread' Image" [CW, Nov. 15] and in the sidebar "Tech Writers Addressing New Audience."

However, I found the same avoidance of the real roadblock to good, sound DP documentation, regardless of its audience, that I've always found. Ken Buechs of Honeywell, Inc. talks about "writing down to your audience," and Amy Kaufman of Advanced Data Management, Inc. and Terry Hughes of Value Computing, Inc. both talk of people with strong writing ability but little technical expertise.

The first reflects the old attitude that the user is beneath the technician and carries with it many psychological and sociological overtones. The second reflects the attitude that a good writer can write about anything given a smattering of exposure.

The real roadblock to good, sound documentation is the industry's willingness to embrace the tenet that DP professionals cannot write. As long as we are not expected to know how to write, we won't.

Technical writing is coming into its own, though not as outlined in the articles. It's coming into its own as it's included in the technical field of one's profession. Good technical writing programs teach technicians how to write to a wide audience about what they know best.

Why can't we have the most knowledgeable person in the development of a product write the documentation for it? The end user deserves no less.

John Major
Information Services Specialist
Academic Computing Services
University of Wisconsin — Eau Claire
Eau Claire, Wis.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters may be edited for purposes of brevity and clarity. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, P.O. Box 880, Framingham, Mass. 01701.

GETTING AHEAD IN DP/Donald J. Berardo

The Realities of Employee Career Planning

'The DP employee experiences great emotional and political stresses when considering upward mobility and when planning for a career change. Any planning by a manager, therefore, must involve the employee at both the emotional and political levels.'

Career planning can sometimes become too theoretical and academic. The realities of guiding and counseling subordinates about career development in the complex field of data processing are quite different from theory.

Because of its matrix nature and the focus it has in most companies, DP forces the manager to learn more than other managers about the psychological and vocational aspects of career growth.

The DP employee experiences great emotional and political stresses when considering upward mobility and when planning for a career change. Any planning by a manager, therefore, must involve the employee at both the emotional and political levels.

Start With Evaluation

The best beginning for a career plan is an evaluation of where the employee has been and how he got there. For example, ask about high school grades, best subjects, best-liked subjects, extracurricular interests and achievements. Do the same for college and other academic history. This history reflects the employee's choices, values and social influences.

Next, include a planned series of questions that uncover the motivation of the employee for being in DP, as well as for past choices, for example, "How did you come to choose mathematics as a major?" "Why did you want to continue in DP?" "Do you 'like' DP?" "Why?" "Are there any special rewards for you in DP?" "Is there any other kind of work you might like more?" and so on. Be sure to let such questions become a platform for the employee to express his feelings about career choices.

If this historical aspect is complete and precedes any specific plan, then he can learn the process of developing a career plan with greater involvement and personal satisfaction. This also offers the employee a chance to "own" his choices without the DP manager imposing any authoritative pressures in the process.

Review Realities

Now that the manager has a better grasp of who the employee is and what values and choices brought him into DP, it is important to review the realities of the existing corporate organization and political structure. Never offer to plan with a subordinate unless you can be open and honest about the realities of your company and the true probabilities of promotion along the normal career development path. In this way, the DP manager can educate the employee about the political realities of his DP organization.

Then review the employee's current job description and ask him to make two written evaluations on these subjects:

- How well is he doing according to the specified objectives of the job description?
- Does he like the job and get satisfaction from it?

If the employee expresses satisfaction and makes a realistic appraisal of performance, then the DP manager might compare this with his evaluation of that individual from the viewpoints of emotions and productivity. Then ask the employee to include a final list of "preferred career objectives." This, again, gives the employee a sense of making choices in the career planning process.

If there is room for growth in the current DP environment, the DP manager now has sufficient data to aid the employee in a "guided" discussion of the real probabilities of career growth in that particular department or division.

It is also a good idea to allow employees to have exploratory "chats" with other DP managers to gather facts about DP areas related to his current position, without making any commitments to a particular move to those areas. This builds trust in his current DP manager and offers the employee valuable input about making a switch to another DP area (or out of DP). The DP manager should have enough corporate and organizational information to offer clear answers to the employees' questions.

Specific Plan

Now the specific career plan can be related to definite goals and steps, coupled with a new job description and a written approval by both parties.

This procedure is based in reality and requires a little more time, but usually succeeds better than other approaches because it intimately involves both parties, which is accomplished by discussing career actions openly and by requiring both parties to act responsibly and realistically. The key steps are:

- Review the employee's background and reasons for choosing DP.
- Know the political and organizational realities.
- Review the employee's job description.
- Ask the employee to make self-evaluations and list career goals.
- Introduce the employee to related DP areas.
- Help the employee draw up a realistic career plan.

Berardo is a management counselor and career therapist. He is a vice-president with the Meld Group in West Hartford, Conn., publishers of a monthly newsletter on management development.

HUMAN CONNECTION /Jack Stone

Starting the Mad Holiday Search For a Personal Computer Upgrade

Oh, wonderful, joyful, happy season of the year when we personal computer owners everywhere turn our attention toward finding fantastic upgrades to our beloved personal computers on sale at incredibly low prices and dropping undisguised hints to the family about what we really want for holiday gifts.

And if your personal computer is as antiquated as mine — a one-time wizard machine that has nearly half a decade clocked on its mainframe, a manufacturer out of business for years and a mean time to failure of about 73 minutes — you surely are, as I am, entering panic mode while in hypersearch for a super/global replacement.

With a leftover Thanksgiving turkey thigh in hand, I settled into my Phase 1 study, starting with *The New York Times* and the New Jersey *Asbury Park Press*.

I first took note of the umpteenth full-page IBM Personal Computer ad I've seen this year, you know, the one that glorifies the concept as perceived by Charlie Chaplin (and some Madison Ave. account executives) and only whisks you past a few machine notes.

But, I'm not IBM-oriented this generation, mainly because after I visited IBM's product center shortly after the original Personal Computer announcement, all I got to carry away was a poorly copied version of a dozen pages of detailed apecs in the same dual-column, fine-print format found in the 30 series write-ups — plus, as is typical, the fading words of the salesman reporting that "the software wasn't quite ready for demonstration."

Just for fun, I picked up on a sala for a 48K Atari Corp. 400, $48.10 off the regular list of $297.70 — plus "$10 to $60 rebate [see clerk for details], which reads out on your own TV screen!" — from the Brick Town Department Store, located somewhere deep in the mudflats of New Jersey.

What really got my attention was the "Compu-table" to support the Atari "with removable hutch for eye-level view in handsome hickory finish" and (thus) "a regular price of $159.70, on sale for only $213!" I tried to phone, but no number was advertised and they weren't listed with telephone information.

Slew of Courses

Then I called Computer Strategies, Spring Valley, N.Y., about its ad in which, besides claiming the well-worn motto "When it comes to micros, we mean business," they implemented the "you gotta train 'em to sell 'em" ploy and offer a whole slew of business, academic and general courses using 64 color computers, including a 10-hour word processing course.

There were no prices quoted, except $595 for the 64 machine. I couldn't get additional facts because the salesman was in a meeting and never called back, although the secretary who responded thought the WP course was $165.

Being a word processing aficionado, I couldn't help comparing this WP course with that offered in an ad from the Taylor Business Institute, Manasquan, N.J., which, as you might guess, used the motto "Taylor Means Business." For a trifling $4,295 and a mere 10 months of my life given to four-day-a-week classes, they could place me as a top-flight WP-oriented secretary. Caveat emptor, guys, in spades.

Granddaddy of Giveaways

But the bonanza was the "Great Deal on Atari 800 Machines" offered in a full-page ad not by the computer retailers, but, if you can believe it, the Dry Dock Savings Bank of New York. This is the granddaddy of savings and loans giveaways: the machines, plus a half dozen programs, retail at $1,434 minimum, but are "free" if you're willing to fork over interest on a three-plus years savings certificate starting at about $3,000.

I phoned, and this is what happened:

Stone: Do you provide initial or follow-up training support?

Dry Dock: Not needed. The system comes with a self-teaching guide and reference manual.

Stone: Could I substitute or acquire new programs from you?

Dry Dock: No. For add-ons, you'll have to go to a retail store or the vendor.

Stone: Will you maintain the hardware?

Dry Dock: What do you mean "maintain"?

Stone: Will you fix it, repair it?

Dry Dock: Sure we will!

Stone: Really?

Dry Dock: Just call us if you have a problem. We'll call the manufacturer and he'll come out. But after the warranty period, you're on your own!

Letters to Stone should be addressed to him at Box 270, 1377 K St. N.W., Washington, D.C. 20005.

READER COMMENTARY /Robert M. Alloway‡

Developing a Strategic Plan: Now or Never

I have spent a number of years studying, conceptualizing, testing and developing an information systems strategic planning methodology, one which, although not perfect, actually works — that is, effectively integrates managers' business needs with information systems strategic plans.

I was rather pleased with myself and the methodology, so I took it out of the academic research environment, cleaned it up, revised it for purposes of practicality and went commercial.

Now, I should not be disappointed for several major corporations have used it with considerable success, and its recurring use in these corporations is quite a positive statement. Apparently, however, I was working on the wrong problem.

I thought the problem was *how* to do information systems strategic planning, but most managers seem to be hung up on the question of *when* to do information systems strategic planning.

In my academic naivete, the question of when to do information systems strategic planning was easy: annually, prior to revising your three- to five-year budget, at the same time all the other functions in the corporation do their strategic plans.

But this answer to the question of when to do information systems strategic planning is clearly deficient.

Most corporations don't do real information systems strategic planning (more than just budget projections and summaries of scheduled projects) at all, let alone annually. So let's back up and see exactly where I went wrong.

Hierarchy of Questions

There is a hierarchy of three questions:

1. Should we have an information systems strategic plan that integrates business needs with information systems strategic goals and resource allocations?

2. When should we undertake the development of an information systems strategic plan?

3. How should we go about developing the information systems strategic plan? (Identify alternative methodologies that are available and evaluate the risk, price/performance, duration, disruptions and so on of the alternative methodologies and choose between them.)

It appears that the answer to Question 1 is a resounding "Yes!" even after discounting considerable lip service.

The answer to Question 2 is, apparently, "Not now."

And Question 3 doesn't get asked because the issue addressed in Question 2 is not resolved. So, Question 3 remains an open question for most managers. Question 2, then, is the problem.

Excuses, Excuses

My naive answer, "Now and annually thereafter," is repeatedly rebuked by the following common arguments:

- Not now because there is a recession, and we are cutting our budget. (A strategic plan is only useful in deciding where to add, not where to cut.)
- Not now because we are reorganizing information systems (to facilitate achieving our nonexistent strategies).
- Not now because our plate is already too full; we do not have the resources to respond to any new strategies. (All current efforts are congruent with corporate strategies, and resources cannot be reallocated).
- Not now because there are no methodologies that actually work (and I won't bother to find out if there are any methodologies that work until somebody else forces *when* to be *now*).
- Not now because . . . (fill in the blank with your own favorite excuse).

It strikes me that there will never be a time in the near or distant future when one of the above situations will not exist.

For example, I can't imagine when user demand will not significantly exceed information systems' capacity to supply. Thus, the answer to Question 2 seems to be: "Never."

Not a Dress Rehearsal

It is high time to stop managing information systems as though it were a dress rehearsal for the real thing, waiting until circumstances are stable to do it right.

Continual change is the real thing for a corporation and information systems. No one month is less likely than any other to be turbulent, so the best thing to do is to pick a month and stick to it annually.

The reality of continual change and limited resources is why corporate strategic planning is critical. This is true for any function within the corporation, including information systems.

Information systems strategic planning can be done under adverse circumstances — or it can never be done at all.

Alloway is president of Alloway, Inc. in Lexington, Mass., and was assistant professor of management information systems at the Sloan School of Management and the Center for Information Systems Research at MIT.

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SUBSET of empty files

LISTCAT DONAME=IJSYSUC NRECS=0

Max NRECS possible in PRIME allocation

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Large files

Subset

FILES IN USERCAT ON WK222		NRECS	FCNT	ALLOC TOTAL	TRACKS PRIM	SEC	FREEPC CI	CA	LMAX	RLRKP /BLKSI	CISIZE	BUFSP	EXCPS	CPR	VOLUME	TIMESTMP
AAAA.KSDS.DEMO.FILE	KSDS	0(16)		1	1	1			948	8,0	2048	4608		1,3		81/09/25
	IX	0		1	1	1			505		512			1,3		
8888.RRDS.FILE	RRDS	0(480)	CY	8	8	0			8185		8192	16384	1	2,3		82/04/01
0000.DEMO.FILE	KSDS	0(600)		4	4	0			80	0,0	2048	4608		1,3		82/10/19
	IX	0		1	1	1			505		512			1,3		
0000.FILE	KSDS	0(100)		1	1	1			100	12,7	2048	4608		1,3		81/12/21
	IX	0		1	1	1			505		512			1,3		
8888.DEMO.FILE	KSDS	0(34.0K)	CY	10	10	0			200	0,0	2048	8192		1,3		81/08/20
	IX	0		2	2	1			2041		2048			1,3		

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SALES.LEDGER.FILE1	RRDS	135	FULL	5	5	0			487		512	1024	830	3,3		82/11/02

Would fit into 9 tracks with different CISIZE

SOUGHT.LEDGER	RRDS	[illegible]	FULL	10	10	0			[illegible]		[illegible]	[illegible]	[illegible]	[illegible]		82/11/02

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IMS Users Get Real-Time Monitor

CARMEL, Ind. — Omnimon has released a real-time monitor for users of IBM's IMS data base management system.

Called IMS Ata Glance, the package reportedly includes batch reporting at detail and summary levels and accounting records at the transaction and batch message processing levels. Performance graphs automatically update once per minute, showing average user response times and transaction rates.

Software programmers can use several display commands to look at IMS internal statistics, a spokesman said. Fifteen thresholds are monitored and exceptions are logged. All exceptions are reported off-line, with the last 100 available for on-line viewing.

One batch report describes an average transaction. Exception thresholds can be set to monitor values and report violations or can be turned off and another batch report used to set limits and print exceptions.

Two batch reports give IMS dependent region activity and data base I/O activity at 30-minute intervals. Batch reports also provide hard-copy backup of all graphs and detail terminal transmission activity, the spokesman said.

The package costs $7,000 with a 30-day free trial from Omnimon, through P.O. Box 745, Carmel, Ind. 46032.

Menu Processor Targets HP 3000

AUSTIN, Texas — Tymlabs Corp. has announced a menu processor for the Hewlett-Packard Co. HP 3000 that reportedly allows both batch and on-line processing to be controlled from any HP 3000 terminal.

Menu Processor is said to replace job streams with menus, enabling users to initiate an on-line program, start a batch update run or print a report with a single keystroke. Features of Menu Processor include menu design and setup, HP and non-HP terminal support and a multilevel menu capability.

Menu Processor sells for $850. A demonstrator version costs $50 from the firm at 211 E. 7th St., Austin, Texas 78701.

Team Approach Advocated To Define Requirements

By H. Blair Burner
Special to CW‡

Requirements definitions are intended to produce a set of specifications for the data processing solution to user-defined problems.

The flaw in this logic is that very often solving one group of users' perception of a "problem" actually creates problems for another group of users. To avoid this, it is necessary to develop models that represent the present and desired processing environments, and then get approval of these representations from the people involved with these environments.

Developing models of the current and desired processing environments requires data gathering, organizing, analysis and recording by a team of analysts.

This interview team merges the ideas of the users they have interviewed into a single specification. However, the people who supplied the information usually have little opportunity to affect the outcome of the analysis. By the time users see the completed requirements specification, it is usually considered too late to make major changes. The impact of this oversight is felt throughout the life of the system.

Team of Users

A better approach is to employ a team of users selected for their knowledge of the environment to prepare the problem

(Continued on Page 44)

Running in IMS/DC Environment

'UFO/IMS' Targets OS Systems

HASBROUCK HEIGHTS, N.J. — Oxford Software Corp. has introduced an on-line application development system for IBM and plug-compatible OS systems running in an IMS/DC environment.

Called UFO/IMS, the package is said to allow the programmer to define the building, formatting and displaying of screens by filling in blanks.

Program execution, testing and verification is done on-line, a vendor spokesman said.

Features of UFO/IMS include: screen definition, which allows the user to fill in a blank 3270 display screen with fields, literals and spaces, after which UFO automatically generates the defined display; automatic access to IMS/DB without the need to write call routines; automatic functions, including display, browse, page, add, update, copy and inquiry invoked by terminal function keys or mnemonic codes and UFO data dictionary.

The spokesman said other features include a built-in English-like query language, menu-assisted development, including prompts and on-line documentation with Help screens.

UFO/IMS operates on IBM 370, 4300 and 3000 series and plug-compatible mainframes and is compatible with OS, VS1, VS2, SVS and MVS operating systems running under IMS/DC Release 1.1.6 or higher.

The price is $60,000 from Oxford, which is located at 174 Blvd., Hasbrouck Heights, N.J. 07604.

Update Tool Out For IMS Data Bases

RESEDA, Calif. — The Lloyd Harvey Corp. has announced Interactive- DL/1 (IDLI) a technique to review and update IBM's IMS data bases from on-line systems running on IBM and plug-compatible mainframes in IMS DB/DC or CICS/VS environments.

IDLI is a conversational program employing a single-screen format for all terminal I/O. It was designed to be used for creation and interrogation of data base test data; but it can also be used to correct problems on a test or production data base and assist in teaching IMS to new programmers, the vendor said.

Two purchase options are available: a direct-purchase option consisting of a one-time payment of $3,950, or an installment purchase plan consisting of 12 monthly payments of $390. The vendor is at Suite 100, 18319 Delano St., Reseda, Calif. 91335.

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Team Method Produces Solutions

(Continued from Page 41)

definition and the requirements specifications. Team members do not have to be experienced systems analysts.

The ideal team size appears to be from five to nine people, not including the conductor and assistant.

Instead of a team of analysts traveling to interview users familiar with the processing environment, these users travel to a selected site to participate in the team session. The first objective is to gather the data necessary to define the problem and the requirements for its solution. A preliminary analysis of the data is then performed, followed by model building, detailed analysis and documentation.

The models built by the team represent the processing environment or the part of it in which the problem is perceived to exist. They must be analyzed to ensure that they represent the environment within preestablished limits of acceptability and are complete, correct and consistent with each other. Errors recognized during detailed analysis are corrected immediately.

Data gathering, organizing, analysis and documentation result in a representation of the present processing environment.

Next, the team studies the two representations to recognize differences and thus the problems that they perceive exist in the present processing environment. A requirements specification contains the executive summary and basic, general and future requirements.

Documentation Effort

The team's documentation effort begins by copying the lists of requirements and models representing the desired processing environment into the requirements kit. Next, they give a detailed definition for each requirement in the lists and summarize each part of the specification to produce the executive summary.

Each member of the team selects or is assigned requirements to define. These are reviewed by the conductor, and approved definitions are placed into the requirements kit in their prearranged position. The requirements specification grows definition-by-definition until each requirement identified in the lists has been placed into the document. By the close of the team session, the team has produced a handwritten requirements specification that is complete, except for a few to-be-done's and final review and approval.

Using the team method, a problem definition or a requirements specification can be produced in a surprisingly short time. The team session normally requires five days. For a large problem definition or its corresponding requirements specification, a team session may run more than five days. A typical problem definition contains about 250 problem elements, and the corresponding requirements specification contains slightly more than 250 individual requirements definitions.

Much of the information presented in this article is taken from Burner's book, Requirements Definition and Analysis, *to be published by Prentice-Hall, Inc. in early 1983. The team method of requirements definition he has described was developed by his firm, Western Institute of Software Engineering (Wise) in Bellevue, Wash., where it is known as the Wise Requirements Team Method.*

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Produces Compile-Ready Cobol

Language Generator Offered

LOS ANGELES — Software Info Services, Inc. has announced a parameter-driven language generator for IBM OS and DOS systems said to produce Cobol compile-ready source code.

Called Cobgen, the package provides complete program logic for file interrogation, record selection, file/record/field updating and report generation, a spokesman said. Generated programs are characterized by structured data division alignment and predictable procedure division logic. The system reportedly allows for inclusion of user-specified source statements utilizing an abbreviated input format, which Cobgen expands to standard verbs and user-defined data names, the spokesman said.

The package costs $8,000 from Suite 1510, 3600 Wilshire Blvd., Los Angeles, Calif. 90010.

MVS Users Get JCL Generator

ATLANTA — Eclectic Technology, Inc. has announced a command processor said to allow IBM MVS users to submit jobs through IBM's TSO with little or no input.

Called the Master JCL generator, the product reportedly generates job control language (JCL) by installation-defined IBM 3270 menus. Data entered during previous invocations may be recalled and the JCL reviewed and edited before job input.

In a production environment, user exits allow job submission without the users having access authority to data sets referenced in the JCL, the company claimed. Conditional JCL statement generation is available, and JCL may be produced and saved in an OS data set. Fixed or free-form control cards can be produced.

Master JCL generator costs $7,500 or leases for $275/mo from 2978 Sumac Drive, Atlanta, Ga. 30360.

Release 1.2 Out Of 'UCC Eleven'

DALLAS — University Computing Co. (UCC) has announced Release 1.2 of its UCC Eleven automated job management system for users of IBM's OS operating system.

The new release offers automated rerun handling and job tracking and provides an implementation operation that eliminates the need to change the job control language, a spokesman said. UCC Eleven can run manager reports on, but not perform, data set maintenance during production processing while retaining restart, rerun and tracking functions.

An on-line simulation feature displays in advance the data set catalog maintenance the package will perform during production or rerun processing for a job. The user can analyze a new job or verify data set maintenance before a restart/rerun is submitted, the spokesman said.

UCC Eleven costs $16,000 from UCC Tower, Exchange Park, Dallas, Texas 75235.

Package Update Aids Microdata

CINCINNATI — Burns & Associates has announced Version 6 of its System Activity Monitor package for the Microdata Corp. Reality and Sequel series of computers.

The package is said to provide the user with a real-time display of disk and CPU usage for all active tasks on the system. Users select the interval to be used by the monitor and direct the monitor's output to a terminal or spooler, a spokesman said.

The package costs $350 from Box 451, Cincinnati, Ohio 45201.

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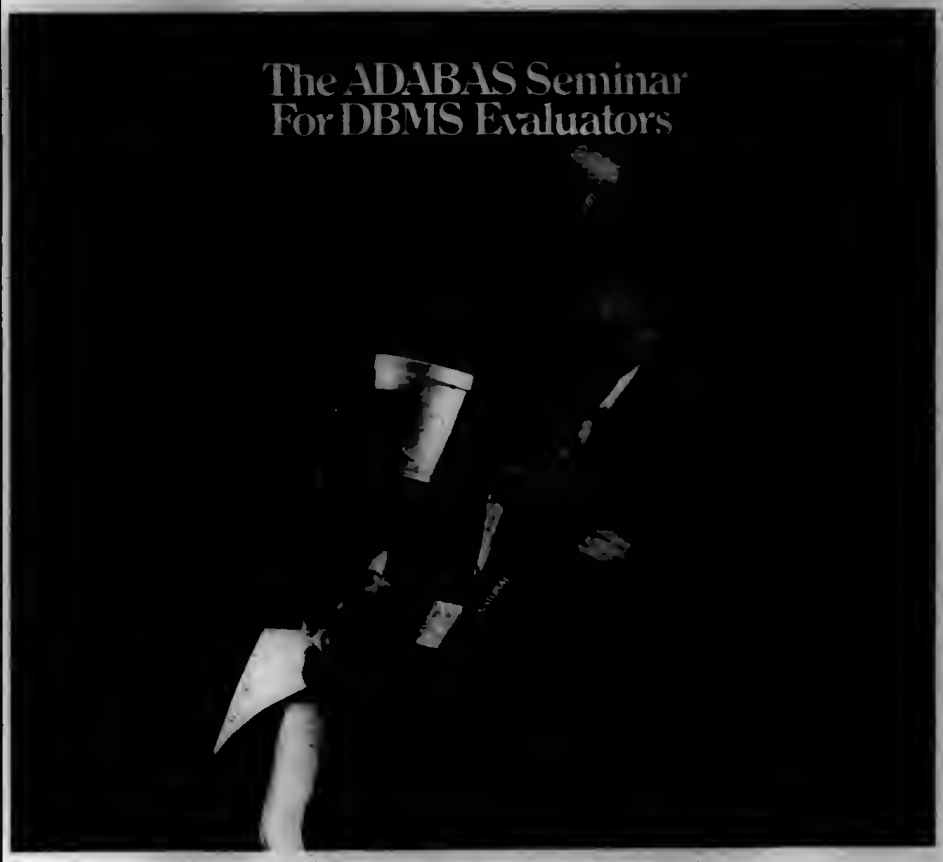

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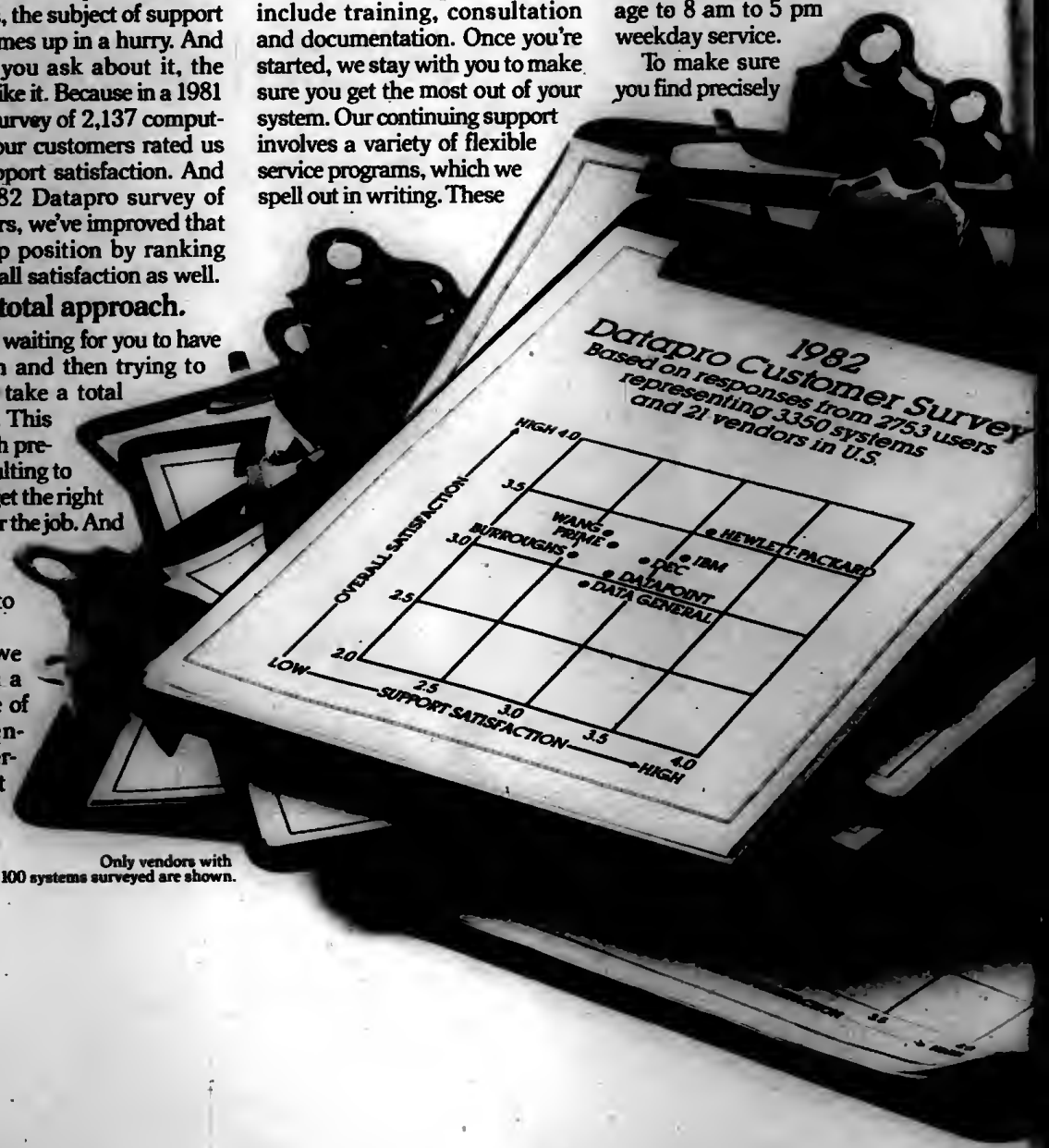

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Securities Trading System Aids Bank Processes

NEW YORK — A securities trading system for banks and to automate fully the process of order entry, broker instruction, execution and settlement was introduced by SEI Corp. here last week.

The system, called Marketlink, is a joint venture between SEI and Monchik-Weber Corp., a software firm specializing in financial applications. According to SEI, user banks that are current subscribers to its Trust-Aid and Securities Movement and Control systems can enter buy and sell orders into their existing system terminals for automatic processing by Marketlink.

The company explained that through SEI Financial Services Co., a broker/dealer subsidiary of SEI, the data is verified against Trust-Aid files and then forwarded via set communications lines to one of three SEI data centers where eventual processing by the Marketlink system is done.

The Marketlink system, residing on SEI's Prime Computer, Inc. 750, then transfers the data to Pershing & Co., SEI's clearing broker. Through Pershing's IBM 3033, the transactions are then routed in turn to the Philadelphia Exchange Automated Execution, the New York and American Stock Exchanges, other regional exchanges and Pershing's over-the-counter desk.

The entire operation, including check backs to the user bank, can reportedly take less than a minute.

The system is currently in use at several banks around the country, SEI said. Charges for Marketlink are based on volume use for users of SEI's Trust-Aid system. There is no additional hardware or communications line charges necessary for these users, the company added from 680 E. Swedesford Road, Wayne, Pa. 19087.

Users of Prime Systems Get C Language Compiler

LA JOLLA, Calif. — A C language compiler for Prime Computer, Inc. systems has been announced by Primarily Software, Inc.

The compiler is reportedly compatible with Bell Laboratories' Unix C Versions 6 and 7 and is accompanied by a set of Unix libraries with over 100 routines, including file I/O, string/character, math and system. The compiler operates at over 5,000 line/min and generates Prime 64V mode object code.

The compiler includes both the Berkeley and new Unix extensions, including enumerated types, structure arguments and assignments, Fortran storage class, identifiers and Unix-style command line arguments, a spokesman said.

The C compiler costs $7,500 for business and industry and $5,000 for educational institutions from 1227 Pearl St., La Jolla, Calif. 92037.

Decsystems Get Fortran Version

MARLBORO, Mass. — Digital Equipment Corp. has announced a new version of Fortran for its Decsystem-10 and Decsystem-20.

Called Fortran-10/20 Version 7, the product is said to support most of the features of the full language Fortran-77 standard and meets the subset language Fortran-77 standard. Fortran-10/20 runs under the Tops-10 and Tops-20 operating systems and is compliant with the subset-level Ansi-standard Fortran-77, a spokesman said.

Improvements over Version 6 include full Fortran-77 character data, structured programming, enhanced single- and double-precision arithmetic, native Tops-20 command interface and enhanced I/O performance, the spokesman noted.

The new version is priced at $11,500 with availability in the spring. A data sheet is available now from DEC at 1 Iron Way, MR02-2/8D2, Marlboro, Mass. 01752.

DSS Targets Corporate Law

NEW YORK — A decision support system for corporate law departments has been developed by Compinfo, Inc.

Corporate Lawpack reportedly allows users to track outside legal costs, monitor internal costs and control docket scheduling. Usable on the Wang Laboratories, Inc. VS series and on the IBM 4300 series and larger, the software comprises six major subsystems: Docket Control, Budgeting/Financial Reporting, Time Recording, Disbursement Accounting, Interdepartmental Charges and File Maintenance.

Cost for the basic system ranges from $10,000 to $15,000, depending on options, a spokesman said from 1860 Broadway, New York, N.Y. 10023.

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Sales Forecasting Package Out for Wang VS Users

ATLANTA — American Software, Inc. has announced the availability of its sales forecasting package to users of Wang Laboratories, Inc. VS hardware.

The package reportedly allows statistical forecasting at single or multiple levels with forecasts at upper levels available with more stable history.

The company's pyramid principle uses upward forecasting and downward forcing to create forecasts that total the same consistent number, a spokeswoman said.

Optional features allow forecasting with irregular demand, graphical plotter, remark by product promotional profile, budget maintenance and between-period simulations. The system operates on the Cobol-supported Ansi standard 68 or 74 for Wang VS in batch mode.

A basic package costs $18,000 from 443 E. Paces Ferry Road, Atlanta, Ga. 30305.

Tool Targets DEC RSTS/E

LEXINGTON, Mass. — A package for Digital Equipment Corp.'s RSTS/E operating system that reportedly reads disks written under DEC's VAX-11 computers with the VMS operating system and copies VMS files to RSTS/E media has been announced by Evans Griffiths & Hart, Inc. (EGH).

VMSPIP is said to preserve the normal resource management system attributes of a VMS file and recognize and properly copy files created under EGH's Ross/V, an RSTS/E operating system simulator under VAX/VMS. This allows a PDP-11 to provide operational backup for a VAX-11 that is running applications under Ross/V, a spokesman said.

A single-CPU license costs $1,250 from the vendor at 55 Waltham St., Lexington, Mass. 02173.

Insurance Aid Out for Series/1

MARINA DEL RAY, Calif. — Insurance management software for the IBM Series/1, designed for independent insurance agents has been announced by International Small Business Computers, Inc.

Flexsystem 10 performs all the accounting, management, policy handling and client service functions.

It costs $9,880 from International Small Business Computers, Suite B, 310 Washington St., Marina del Rey, Calif. 90291.

'Series 7000' Adds Features

DENVER — Auto-trol Technology Corp. has announced an enhanced version of its Advantage Series 7000 graphics software for users of Auto-trol's Advanced Graphics Workstation and Digital Equipment Corp.'s VAX-11 processors.

A spokesman said the enhanced version includes a multiple-language feature that allows for non-English versions of the software. Full-color capability allows assignment of color for construction, grid, view vectors, names and borders. Quick Dimension and Quick Filleting features are said to reduce user interaction.

A Fortran-based applications interface is included, and a flat pattern development package is available, which can unfold planar-faceted objects including complex geometry.

The graphics software package costs $93,000 from 12500 N. Washington St., P.O. Box 33815, Denver, Colo. 80233.

Driver Lets 'DI-3000' Users Access Terminal Features

BOULDER, Colo. — Precision Visuals, Inc., has introduced a software device driver that reportedly allows users of the company's DI-3000 standardized graphics software package to take advantage of the hardware and firmware features of its recently announced Envision 220 color graphics terminal.

The driver, when used in conjunction with the Envision 220, is said to speed graphics applications, including presentation graphics, process control, computer-aided design and manufacturing and decision support, according to a spokesman for the vendor.

It supports such features as complex polygon fill-in firmware, up to 31 possible polygon patterns in firmware, five hardware line styles, two hardware fonts with 16 sizes, a firmware stroke font for exact sizing and complete zoom and pan.

Licenses for the Envision 220 device driver are priced at $500.

The Envision 220 color graphics terminal is available for $4,950 from Envision Technology, Inc., San Jose, Calif.

A 25-year license for DI-3000 starts at $8,000 from Precision Visuals at 6260 Lookout Road, Boulder, Colo. 80301.

HP, Prime Users Get File Aid

HOUSTON — Mountain Software Growers, Inc. has announced a file maintenance package for users of Hewlett-Packard Co. HP 3000 and Prime Computer, Inc. Series 50 computers.

Called the H4/Equal Data Maintenance Program, the package reportedly allows the user to create test data and check output, correct file errors, model applications, test and demonstrate designs and load initial data for a new application.

The package includes plain-language commands, a spokesman said. H4/Equal costs $4,000 from Suite 236, 3815 Montrose Blvd., Houston, Texas 77006.

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Direct Ups 800 Line With Terminal For VAX-11 Users

Direct Model 831

LAS VEGAS — Direct, Inc. has expanded its field-upgradable 800 series of terminals with a Digital Equipment Corp. VT100-compatible block mode terminal for DEC VAX-11 environments.

At the same time, the company announced business graphics capabilities and an integral modem for its Hewlett-Packard Co.- and DEC-compatible terminals and personal business computers. Bar code and label-generating software was also announced for the company's 1000 series microcomputers.

The Model 831 terminal is said to feature a 16K-byte display memory, local

(Continued on Page 56)

Canadian Retrieval Service Aims at Proprietary Logon

By Phil Hirsch
CW Washington Bureau

OTTAWA — Although several commercial information retrieval services now provide remote access to all sorts of data base information, they have a common failing: a proprietary logon procedure.

The user who needs access to multiple data bases must learn multiple procedures. Also, switching from one service to another can be time-consuming because the network must be dialed up separately, prior to each access. A new system developed by the Trans-Canada Telephone System (TCTS), headquartered here, appears to solve these problems.

Known as Inet, it consists essentially of a common sequence of logon commands which connect the user to any of several remote data bases. The stored information can be graphics or alphanumeric. Inet also performs protocol/code conversion. It interfaces with terminals utilizing Trans Canada's Telidon videotex system, as well as with Ascii-compatible alphanumeric terminals, and converts text formatted for one type of terminal so it can be displayed on the other.

At the moment, Inet is four months into a one-year technical trial. Four hundred business users, dispersed across Canada, along with some 30 information providers, are participating. About 250 of the terminals are Telidon-compatible, the rest are Ascii-compatible alphanumeric devices.

When the technical demonstration ends next July it will be followed by a market trial involving more participants. Then, assuming enough interest has developed, inet will become a commercial offering.

If and when that happens, Inet will provide two other capabilities that should endear it to data base users. One is a "public directory," a constantly updated listing of the remote data base services available through Inet. "One reason there aren't more users of on-line information services," explained Gwen Edwards, Inet's marketing director, "is that users have a hard time finding out what's available. Our public directory is designed to fill that gap."

Another feature of commercial Inet service will be a consolidated monthly bill. Regardless of how many retrieval services the user accesses, he will re-

(Continued on Page 54)

Station Merges Phone, Terminal

CUPERTINO, Calif. — A personal information station that reportedly merges two devices — the telephone and computer terminal — has been introduced by Tymshare, Inc.

The Scanset XL is said to handle the communications needs (voice transmission, access to stored data and electronic mail) of noncomputer professionals.

Designed to access rather than input data, the Scanset XL features a built-in modem and automatic dialer, as well as computer log-in — all of which reportedly help the user easily access information.

The 9-in. screen holds 24 lines of text with 40- or 80-char. line lengths. The terminal also has limited graphics capabilities, a spokesman for the firm said. The unit costs $895 from 20705 Valley Green Drive, Cupertino, Calif. 95014.

Scanset XL

Fiber-Optic System Runs 100K Bit/Sec

PORT WASHINGTON, N.Y. — Math Associates, Inc. has introduced a full-duplex RS-232C-compatible fiber-optic transmission system said to transmit an asynchronous signal at rates up to 100K bit/sec over distances of up to 2,000 meters.

The XR-1100 consists of a transmitter/receiver and features an integral 25-pin connector and a built-in ac or dc power supply. The system can be used in most RS-232C-compatible applications, including data transmissions, computer peripherals and transducer interfaces, a vendor spokesman said.

The XR-1100 is available for $395/pair from Math Associates, Inc., 6 Manhasset Ave., Port Washington, N.Y. 11050.

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AT&T Unveils Six DP Terminal Products

NEW YORK — AT&T has introduced six terminal products including a modem and a high-speed matrix printer.

The Dataphone II 2096C modem is said to allow users to operate at 9,600 bit/sec in a multipoint, leased-line environment with up to 15 tributaries. It costs $264/mo in a multimount configuration and $288/mo in a stand-alone mode.

The 4540 local-channel controller is the first Bell system product to connect terminals directly to a mainframe without a phone link, Bell claimed. It attaches directly to the I/O channel of a host computer and meets local network requirements in the IBM 3270 synchronous environment. It costs $530/mo.

The 3330 Model 106 matrix printer was designed for use in any Bell Dataspeed 4540 terminal environment or for distributing messages in the Dimension PBX (private branch exchange) message center directory application where expected printout volume does not require higher printing speeds. It costs $155/mo.

The 3330 Model 201 high-speed serial matrix printer utilizes bidirectional printing and a dual-column 14-wire print head and prints at a nominal rate of 340 char./sec It costs $245/mo.

The Quorum Teleconferencing Bridge is an integrated voice/data device for multipoint teleconferencing. It allows an attendant to manage up to four simultaneous conferences of seven ports each, or up to 28 ports in a single conference, without loss of voice quality, a spokesman said. A 14-port model leases for $2,100/mo on a one-year plan and $1,600/mo on a two-year plan. Twenty-one- and 28-port models are also available.

The Quorum Teleclass Bridge enables teachers to have personal voice and graphics contact with up to 20 off-premises students via the normal telephone network. It comes with 20 ports and costs $1,800/year.

All these terminal products will be available from AT&T in the first quarter of 1983.

Modem Interacts With Terminals

SUNNYVALE, Calif. — Racal-Vadic, Inc. has announced a Bell 212A/103-compatible modem that is said to be capable of interactively communicating with data terminal devices.

The VA212 modem features a front-panel, tactile-touch 16-key keyboard, eight-character LCD; and built-in automatic dialer. Twenty-six user-programmable options are reportedly atored in the modem's memory.

The unit is said to provide full-duplex automatic or manual originate/answer operation at 1,200 bit/sec or up to 300 bit/sec. The VA212 connects to a switched telephone network via a standard data or voice communications jack.

The VA212 costs $795 from 222 Caspian Drive, Sunnyvale, Calif. 94086.

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Global Logon Key to Service

(Continued from Page 51)

celve a single statement and be able to pay with a single check, which should reduce paperwork in many cases.

Besides standardizing the logon procedure, Inet has an "extended access" feature that takes the user quickly to the part of a remote data base he is interested in. For example, he can program the system so that as soon as he has completed the logon, his screen displays, for instance, the utility stock quotations provided within a stock market reporting service.

"If you think of the logon as a means of getting the user to the data base provider's front doorstep," explained Jim Bartoszwicz, technical director of the Inet trial, "then extended access is the guide that takes him through the building to the file cabinet containing the information he'a seeking. Proprietary data base access systems have this same basic capability, but they employ different procedures and generally require the user to enter information manually. Inet'a extended access is automatic."

When a user joins Inet, he supplies a "personal profile," through his terminal, that specifies what he wants in the way of extended access capability. He can also elect to receive information in French or English, define special characters for line deletion and other functions and order brief or detailed prompts to help him through the session with a remote data base.

"A key feature of Inet," explained Marketing Director Edwards, "is that it stops short of apecifying how data base information is to be processed once the user has retrieved it. Our job is to provide our customer with the shortest, quickest path to the portion of the data base he's trying to reach.

"Once there, however, he begins using the information provider's software, or possibly his own. Thus, a customer who wants to massage data base information in his own way doesn't lose any freedom of action by going through Inet.

Harris 9200 Systems Gain Personal Computing Option

DALLAS — Harris Corp. has added a personal computing option to its 9200 family of interactive communications systems.

The option gives 9200 users the ability to perform stand-alone personal computing or to combine personal computing with interactive functions, according to a spokesman for the vendor.

The personal computing option, which costs $6,200 per terminal, consists of a CRT terminal, two 8-in. disk drives offering 1M byte of memory and Digital Research, Inc.'s CP/M operating system, a spokesman for the vendor said.

Harris announced a similar personal computing capability for its distributed processing system, called the Mind System, earlier this spring.

The 9200 is manufactured by Harris' Information Terminals Group. The firm is located at 16001 Dallas Pkwy., P.O. Box 400010, Dallas, Texas 75240.

Multipoint Mux Boasts Switching

RESEARCH TRIANGLE PARK, N.C. — A switching multipoint multiplexer has been announced by Network Products, Inc.

Babynet is said to be the first product to make available a combination of switching and multipoint multiplexing. Its switching capability reportedly allows dynamic mapping of connections from remote ports to computer ports.

The user-expandable system comprises three major functions — master, master expansion and node — all included in the same piece of hardware and all interchangeable.

Babynet may be configured with a master of up to 22 ports and up to eight nodes with up to eight ports each, a spokesman for the vendor said.

Babynet is said to work with virtually any asynchronous communications terminal, including CRT terminals, serial printers and bar code readers.

The system features diagnostics and error detection and correction. The two-port multidrop multiplexer unit costs $1,250; each three-port expander kit is $475.

The vendor's address is P.O. Box 13239, Research Triangle Park, N.C. 27709.

Options Added To Infotron 790

CHERRY HILL, N.J. — Infotron Systems Corp. has added switching and contention capabilities to its 790 Network Concentrator.

The option is said to permit authorized terminal users to be connected to any compatible port on any computer in the network. The option permits a large number of terminals to contend for a fewer number of ports, a spokesman for the vendor reported.

The 790 accommodates up to 640 inputs in any combination of synchronous and asynchronous devices, dial-up and dedicated, at speeds up to 9,600 bit/sec. The unit reportedly can be configured in various multipoint network arrangements with other 790 units and with Infotron Supermux 480, 616, 632, 680 and 780 statistical multiplexers.

Advantages are said to include lower transmission costs and centralized network management and control. Prices start at $19,000. The switching and contention option costs an additional $7,500. Delivery is in 180 days from Cherry Hill Industrial Center, Cherry Hill, N.J. 08003.

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Controller Works in IBM 3270 Net

CAMBRIDGE, Mass. — Industrial Computer Controls, Inc. has introduced a terminal controller designed to replace the IBM 3274 Cluster Controller in an IBM 3270 network.

Release 4 of the CA-20 Terminal Controller emulates the 3274 and allows up to eight asynchronous terminals to communicate with the host processor as IBM 3278 terminals.

The controller can also switch between two synchronous host lines to allow sharing of resources. The CA-20/4 comes in two models. Binary Synchronous Communications and Systems Network Architecture/Synchronous Data Link Control.

Each controller costs $8,600 from 196 Broadway, Cambridge, Mass. 02139.

ADC Cuts Monitor Prices

MINNEAPOLIS — ADC Magnetic Controls Co. announced that it has cut the prices of its two data line monitors by nearly 25%.

The DM 775 has dropped from $4,550 to $2,995, and the DM 776 has gone from $5,500 to $4,695.

ADC is located at 4900 W. 78th St., Minneapolis, Minn. 55435.

Direct Terminal Line Expanded for VAX

(Continued from Page 51)

editing capabilities, field definition and data entry checking routines, user programmability, downloading and debugging and switch- and program-selectable 80- or 132-col. display in one or two phosphor colors. The 831 can be field-upgraded to a Digital Research, Inc. CP/M-based 8-bit microcomputer, a spokesman said.

The 831 also offers asynchronous point-to-point communications in full- and half-duplex with separate keyboard-selectable transmit-and-receive rates from 50 to 19,200 bit/sec. The terminal is priced at $1,395.

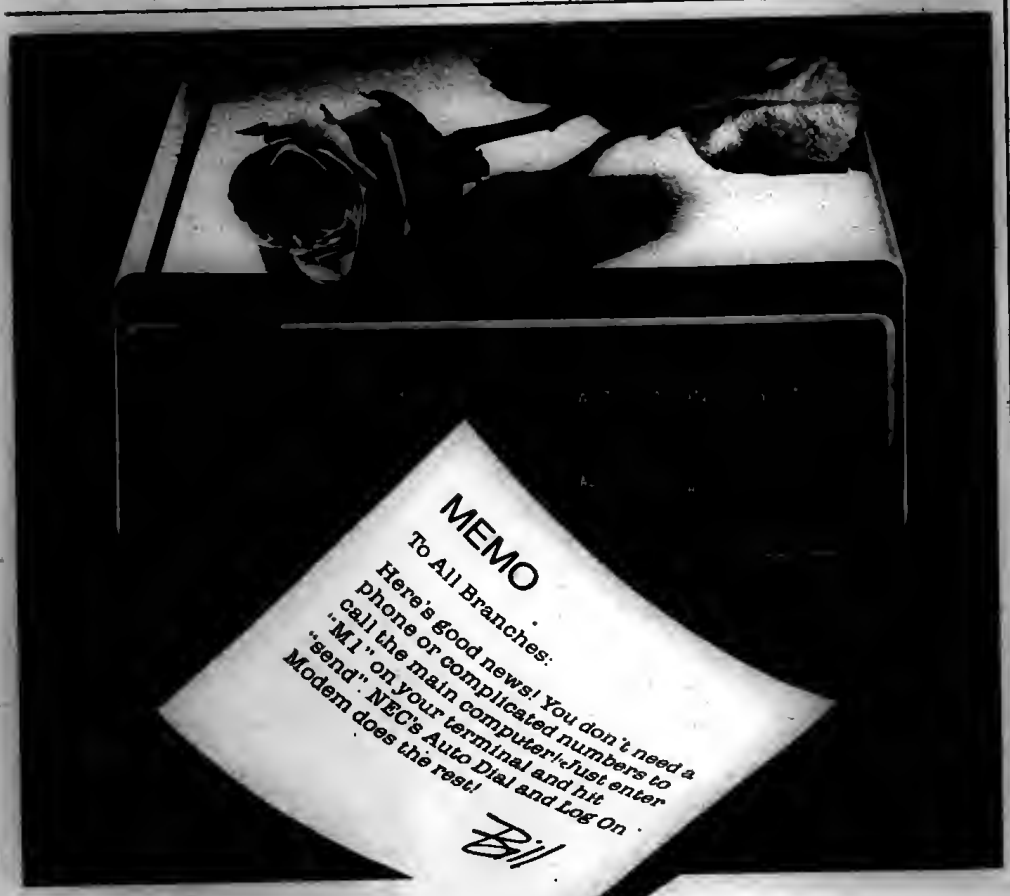
A proprietary graphics board makes it possible for users of the Direct 800 or 1000 series products to emulate Tektronix, Inc. 4010 and 4014 graphics systems. The company is also offering a CP/M-based, user-friendly business graphics program for its 1000 series of microcomputers. Using English-language commands, users reportedly can base their graphics output on data from the corporate host system or can plot data generated by the terminal. The graphics board option costs $1,395 with availability set for the first quarter of 1983.

An integral Bell 212A-compatible modem allows users to establish communications over standard telephone lines, the spokesman said.

Features include originate and autoanswer modes with automatic speed selection, autodial and retry and keyboard selection of parity, number of bits per character and stop bits. The modem is priced at $895.

Bar code and label-generating software enable the company's 1000 series computers to display and format bar codes and custom labels. The user can design the label on the Series 1000 screen, change label width or height and specify whether data is to be printed from a diskette file, entered at the keyboard or merged with another data file, the vendor said.

An entry-level configuration, consisting of a Direct 1000 intelligent terminal, software and printer costs $10,000. All products are available from Direct at 4201 Burton Drive, Santa Clara, Calif. 95050.



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COPING WITH MICROS

By Jack Ewers

Corporate DP has survived many technological revolutions in its short career, but now it faces a powerful new force it cannot defeat: microcomputers. Not only have they invaded the DP empire, but they are winning the war. And it is a completely different kind of confrontation for corporate DP.

The battle is not being fought in the traditional DP stronghold — the high-budget arena of mainframe computers and expensive systems and programming staff. The war is raging in the day-to-day work environment where things are done cheaply and quickly. Your users are being won over by the local presence of "grass-roots" computing power that responds quickly to their unique needs.

In contrast, traditional DP is viewed as a well-fortified castle: remote, impregnable, walled in by three- to five-year backlogs, expensive and rapidly losing contact with the community it was designed to serve. While microcomputers are becoming more active in your user community, the information services department is being drowned by bureaucracy, mainframe technology and dinosaur systems that have evolved over the last 20 years.

If DP is to survive, you must learn to adopt the tactics of this new war. You must learn to use micros and apply them to the needs of your users — at user locations. This can't be done from within the walls of your computer room.

It is ironic that DP has always acted as an agent of technological change for the rest of the corporation and micros are now forcing a major technological change on DP. DP cannot resist the micro revolution for long. It must become part of this revolution or it will slowly evolve into another unresponsive, out-of-date, expensive, ignored and eventually extinct corporate bureaucracy.

How can corporate DP cope with this new force? First, you must recognize the strengths and weaknesses of your "enemy." Second, you must recognize when you can't win the war and therefore begin searching for compromise solutions.

Microcomputers' strengths can be used effectively by a savvy DP manager. For one thing, microcomputer solutions are generally quicker and cheaper to implement than mainframe solutions. The hardware can be acquired for less than

ILLUSTRATION BY JON McINTOSH

IN DEPTH

$4,000 — an expense item in some budgets and four to five times less than most mainframe peripherals. More important, it is cheap enough to be acquired by user departments and justified by a single application. No lengthy appropriation process is necessary.

Second, the hardware is available immediately through local outlets. No three- or four-month vendor delays need be endured.

Third, many packaged software solutions are available immediately and at very little expense. There is seldom a need to become involved with complex operating system software and a vast array of mainframe hardware. Consider for a moment the time and investment that would be required to implement the capabilities of Visicorp's Visicalc and Visiplot on a mainframe using IBM's IMS and CICS.

Similar savings are possible in other areas such as graphics (something DP has talked about for 10 years and has not yet implemented), simple on-line financial applications and so forth.

In addition, micros are simple to install and use. No special wiring or air conditioning is needed, and they don't require trained operators. School children can operate and program them. Most of the commercially available software is no harder to learn than Mattel Electronics' Intellivision golf. Because they are simple to use, they can become effective tools very quickly in any office environment. And because they are simple, they are *used* — enthusiastically. They may be compared to sophisticated but very educational toys. Their owners enjoy using them while receiving real benefits.

Micros give users total control. The data, hardware and software are completely controlled by the owner. His data is available when he wants it, and its content is completely determined by him. The hardware is available when he wants it; it is not tied up by rigid schedules beyond his control. Finally, the software is under his control. He can fix it by himself immediately, without filling out a project request justifying the programming cost or waiting until his request rises to the top of the priority list.

Micro workstations are multifunctional. Purchasers of microcomputers soon discover that many tasks can be addressed by the hardware. Document preparation is part of every office environment and micros can significantly enhance the productivity of that operation.

The micro can act as a terminal providing access to corporate mainframes. It can inquire into mainframe data bases, serve as an input device for transaction processing, collect transactions locally for later transmission to a host or receive data from the host and store it for later manipulation or display. Once a micro is installed, its use increases dramatically until most facets of office life are touched by it.

Microcomputer Weaknesses

The micro does have some weaknesses, however. First, implementation requires effort. While the micro is easier to use than a mainframe, it is still much more complex than other tools users normally work with in their offices. It takes time to learn how to use a micro, and hardware and software malfunctions *will* occur.

Users soon realize that commercially available software is never completely "turnkey." There are almost always "minor" software modifications that would be nice to have. Those who venture into the world of software development encounter the age-old problems of design, testing, maintenance and documentation. This is an expensive process and takes valuable personnel away from the work they were hired to do. In addition, some work is required to prepare and enter data.

Micro technology is advancing so rapidly that in a few years, today's new micro will be obsolete. New software will not run on the old micro, and old software will not run on the new models. Users must then choose between stagnating with their present configuration and purchasing new hardware. If they acquire new hardware, they must operate with incompatible sets of

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hardware and software or struggle through their first conversion effort.

Data storage and processing power is limited, so there is a limited set of applications appropriate for today's micros. Users eventually will want to process large corporate DP files through complex systems. These requirements will tax the resources of most micros.

There is no free lunch — extensive use of micros by a user department will eventually demand full-time resource commitments. Large user departments may form their own micro staffs; small departments may pool resources to form a centralized micro staff. If you are smart, you will be in a position to help remove this growing burden from users. You will have the necessary expertise and the trust of user departments.

What Can DP Do?

Armed with an appreciation of the strengths and weaknesses of micros, you can begin to counterattack. The first maneuver is to begin using micros in your own shop — develop a familiarity with them and exploit their capabilities.

Search for likely applications of the technology. Take advantage of the low cost and quick implementation to help reduce backlogs. That new on-line order entry system that has been promised for years might be implemented in months on a micro. It may not contain all the bells and whistles, but it can contribute to the efficiency of the order department.

How about that grandiose network linking all the field offices with headquarters that has been in the feasibility stage for two years? Why not begin with a few micros in field locations linked to headquarters via dial-up lines to gain experience in local data collection and forwarding? It may be a quick, low-cost, intermediate solution until better network capabilities are available, and it would show the field that you do think of their needs occasionally.

What about that on-line inquiry system the users have been clamoring for? If the volume of data needed is not large, consider loading and providing access to it from a micro using one of the micro data base management packages. If the data can be fragmented by user, it could be spread over several micros.

Give your users something new — like graphics. Graphics packages abound on the micros and they are not difficult to interface with mainframe data. Many managers already graph key data they get from DP so that they can recognize trends. Why not do this for them?

Expand management's use of local computing power. DP has been talking for years about putting terminals on managers' desks, but so far has had little success. Look around your organization. You will probably find more micros being used by managers than terminals implanted by DP. Let them overcome their fear of the keyboard through easy-to-use packages like Visicalc. Soon they will be anxious to investigate more complex terminal applications.

'The on-line order entry system that has been promised for years might be implemented in months on a micro. It may not contain all the bells and whistles, but it can contribute to the order department's efficiency.'

Give your programmers a chance to use micros in their own assignments. The world of micros also provides an exciting new area of investigation for your DP staff. Many of your people are probably deep into micro technology already. Programmers love to investigate new technological areas. They would certainly enjoy a break from maintenance.

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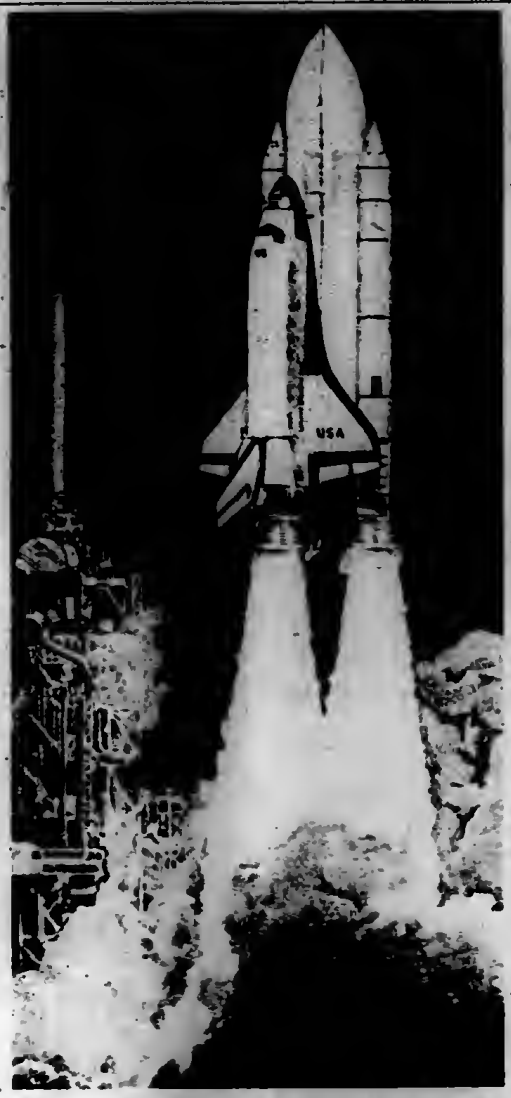

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Be helpful but not expensive. Assist your users in sorting out the competing claims of hardware vendors, software packages, communications options and so on and gain their trust. Dedicate someone to learning the hardware, operating systems, application packages and acquisition techniques. Users don't *really* want to become experts in these areas, nor do they want to delve into technical problems. It's easier to let DP do that. If you can offer something of value — helpful expertise — it will be used.

In the micro world, DP does not own the hardware or control the application. It just advises. Some adjustment to traditional DP thinking will be necessary to overcome the fear of free users who are now able to make a few technological decisions for themselves. Refrain from running through the corporate halls screaming about anarchy, and let the user do some things that do not fit into your grand plan. If your free advice is a thinly disguised means of exercising control, the users will go underground again and you'll never know what they are doing.

Have a well thought-out strategy for recommending certain hardware, communications options and so on, and explain why it is advantageous to comply with that strategy. Suggest standardizing on certain hardware. Arrange special pricing for that hardware with the vendor. Offer hardware backup facilities. Users want the assurance that they are making the right decision and will appreciate your help. But be sure you are making helpful suggestions — not issuing mandates.

• *Act as a clearinghouse for internally developed or commercially available application software.* Applications developed in one location, perhaps a branch office, are often usable in another, since most branches perform the same functions. That branch inventory system developed in Fargo may be just the thing to help manage inventory in New Jersey. But New Jersey has no idea what Fargo is doing unless some mechanism, such as a clearinghouse, is established.

• *Share software development and maintenance standards and procedures.* DP has been dealing with these areas for 20 years, and out of that 20 years of chaos some fairly sound life-cycle methodologies have arisen. We know how to develop, maintain and document software and have developed effective procedures and standards.

Share these ideas with the micro people. Help them out instead of letting them slog through years of chaos with poorly maintained software. Work with them to adapt your standards to the micro world. Offer your help with no strings attached. Don't try to impose corporate standards. Remember, you are trying to make friends with the micro people, not antagonize them. No matter how good your standards are, users probably won't pay for them and certainly will reject the offer if it is seen as an act of domination.

• *Allow gateway access to your mainframe via micros.* Micros are excellent gateways, and the micro people should be encouraged to use them as such. "What? Allow the micro people free access to our sacred mainframes and vast storehouses of data? It has taken us decades to assemble this mass, and you want me to expose it all to groups of technological barbarians?" Well, some controls are certainly necessary, but we tend to forget that our storehouses are full of data we gathered from the users. It is *their* data, and they just want to look at it. That sounds reasonable. So, begin to let your users peek at their data via their micros.

First, help your users gain time-shared access to your mainframe. Many packaged applications such as financial modeling, market statistics and modeling, are available through time-sharing.

Second, suggest appropriate small quantities of data that can be downloaded to a micro for manipulation by a micro person. Corporate data can be replicated without fear of destroying the source. It can be formatted for use by micro software such as Visicalc and Stoneware Microcomputer Products' DB Master, designed

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for flexible use by nonprofessionals. There are excellent graphics packages for micros that can present the data in a more usable format once it is received from the mainframe.

Third, permit data to be uploaded from micro to mainframe. Data can be entered and manipulated on the micro, perhaps through Visicalc, and then transferred to the mainframe for further processing, roll-up and so forth. This can be a quick, inexpensive and easily implemented way to bring in data from remote locations.

Steps two and three can be combined in some cases. For example, during a planning cycle, year-to-date and historical data could be sent to branch locations as a base for building year-end and next-year revenue and expense plans. This data could be manipulated by each branch using micro software, transmitted to regional or home office sites for roll-up and further manipulation, and the adjusted plan could then be transmitted back to branch micros for display or printing.

Fourth, allow direct access to mainframe data. A micro can be a node in a transaction processing network or a tool for using query languages. Unlimited access to all data is probably not wise, but DP should realize that its future may lie in maintaining "core" bases of data accessed from user locations via micros.

• *Develop an expertise in office automation, especially micro word processing capabilities, and introduce your users to the possibilities it offers.* Addition of a daisywheel printer to a micro permits production of letter-quality output at much less marginal cost than the purchase of a complete word processing system. Micro word processing software and communications capabilities open the way for electronic document transfer.

For example, the micro can be a node in an electronic mail network. Users can prepare messages on the micro, send them immediately or queue them for later transmission. Their incoming mail can be received in the same manner, and each user can choose the type of printer he wants for incoming mail. It is another inexpensive, quick way to expand local computing power and bring that power closer to user management.

• *Explore the advantages of application development on a micro.* For the price of most time-shared terminals, a programmer can have a dedicated software development tool guaranteed to be compatible with the target machine. Debug capabilities on micros are approaching mainframe capabilities. Turnaround for the programmer is improved. He has his own printer. His time-share response is not degraded by other users and his printed output does not get stuck behind those extremely large, high-priority production reruns.

Mastering the complexities of mainframe operating systems, utilities, development tools and so on takes extensive training. Application software development on micros is much less complex.

Use micros to develop prototypes for more extensive follow-on systems. For example, create a simple prototype of your branch inventory system quickly using micros. Work with a few branches to see what they do and don't like. Change the software and iterate this process until you have a good idea of what the system should do. Then create those capabilities on the mainframe.

This approach is quick and inexpensive. The user doesn't have to wait 18 months to find out he doesn't like the system and then be powerless to change it. The prototype may not have all the power of the eventual mainframe version; the data base accessed may be a subset, but the user interface will be realistic.

In conclusion, the world of micros is upon us. Micros already offer many advantages over the more traditional ways of applying computers to business needs.

Today's DP manager needs to recognize the potential of the microcomputer and adapt it as another tool for delivering timely information to his user base. The micro *will* be a major force in the corporate world. It is smart to be aligned with that force from the beginning.

About the Author

Jack Ewers is manager of systems and programming for Honeywell, Inc.'s Building Services Division in Minneapolis and is responsible for the planning, design, development, implementation and maintenance of business systems.

Ewers has also provided consulting services to internal Honeywell divisions on data base/data dictionary, DP productivity, security and office automation.

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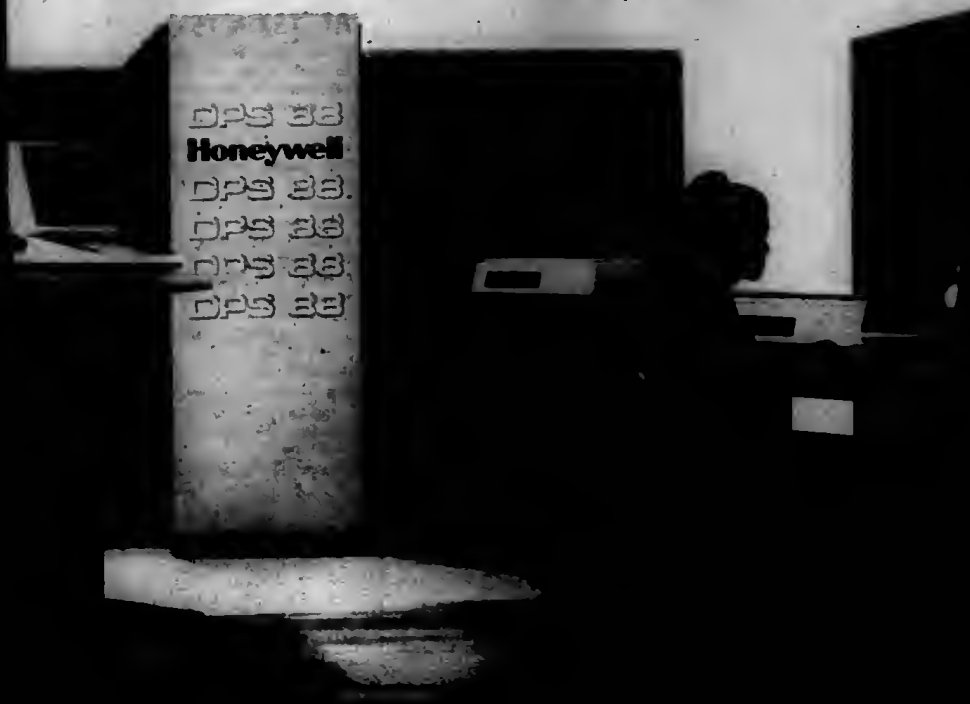

IN DEPTH

plement the operational systems of their businesses. Unfortunately, soaring maintenance requirements and end-user demands for new application development have generated a huge systems backlog. In fact, a recent study by the Sloan School of Management at MIT found that this backlog averages more than 30 months. The result has been an increasing need to off-load some systems development work from the DP department to the user community.

Data creation, retrieval, manipulation and analysis are now accomplished using new tools provided by an information center. These tools have come to be known as fourth-generation languages.

With the user-friendly tools on the market today, end users can develop their own queries and reports and manage their own data files. Nonprocedural, English-like languages are flexible and can respond to a variety of requests.

Once educated in the use of such languages, end users become more valuable within their own departments. And by assuming more of the responsibility for their own DP needs, they can help alleviate the systems backlog within the DP department.

Traditionally, end users' applications needs have been geared toward transaction-driven systems such as payroll, accounts payable and receivable and inventory control. For these needs, they used systems predefined by DP department personnel.

However, with the overwhelming acceptance of the computer in end-user departments, managers soon realized that the ability to analyze operational data was useful and even necessary in their decision-making. Ad hoc reports on full or selected parts of files came to be requested by virtually every department. Corporate planning, marketing/financial analysis and word processing are just three of the major areas in which new end-user needs have grown. With the tools of an information center, a new breed of end users is emerging.

A few of the more common user-friendly tools are:

- A Departmental Reporting System (IBM).
- Answer/DB (Informatics General Corp.).
- Easytrieve (Pansophic Systems, Inc.).
- Focus (Information Builders, Inc.).
- Graphic Data Display Manager (IBM).
- Inquire (Infodata Systems, Inc.).
- Query by Example (IBM).
- SAS/Sasgraph (SAS Institute, Inc.).
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Besides assisting end users in selecting appropriate language tools, the information center consultants

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interface with DP personnel and help resolve problems.

Training Users

To reap the full benefits of the center, end users must learn the basic DP concepts and skills necessary to use fourth-generation languages. But many end users work within a department that is remote from the computer and the DP department. They access the system through a data communications facility and terminal. DP is not their primary area of responsibility; they view it as one of the tools for helping them perform their jobs more effectively.

To decide which training method will work best for this group, the training specialist must evaluate costs and benefits. He commonly looks at three alternatives: classroom or stand-up lectures, multimedia (video) presentations and CBT.

Classroom Presentation

Of all the characteristics of the stand-up classroom teaching methods, five areas of concern stand out:

1. *Costs.* The costs of classroom training include instructors' fees, classroom expenses and user relocation. Many users need transportation and lodging.

2. *Scheduling.* Instructor, student and classroom time must all be coordinated. This is not easy. By the time a training coordinator arranges for enough students to justify the costs of the instructor and the classroom and then schedules the class, the user is often too busy to attend.

3. *Availability of qualified instructors.* With the rapid proliferation of user languages and tools, it is difficult to find qualified instructors who are up to date. In addition, few instructors understand how end users' training needs differ from those of DP professionals. Unfortunately, there are many people who believe that to introduce DP concepts and skills to the end user, one must teach slowly and loudly.

4. *Appropriateness of individualized training.* Users within an information center come with different learning goals as well as diverse backgrounds, so materials should be tailored to the individual. Unless instruction is one-on-one, training falls short. Training should also provide for additional topics and drill and include the option for users to bypass material they consider unnecessary.

5. *Effect of hands-on vs. passive methods.* Although seminars and instructors can be stimulating, users don't really learn how to use data processing tools unless they actually try them. Otherwise, by the time they return to their terminals, they have forgotten much of the new material and cannot review it easily.

Multimedia (Video)

Multimedia training works well, especially when the learning center is centralized. However, the distance of the learning center from the users' work location is a drawback.

If the presentation and training require a video display system, the number of users is limited to the number of video display machines and tapes. If there are more users than there are display machines, scheduling problems arise. If the teaching techniques employ more than a video presentation, then access to these other media (manuals, workbooks, computer) must also be scheduled. This can be cumbersome.

It is difficult to update a video presentation and customize it to each center's needs, but it is not impossible. Updates and customizations may take the form of additional tapes, splicing current tapes or adding new

'The information center's users come with different learning goals as well as diverse backgrounds, so materials should be tailored to the individual. Unless instruction is one-on-one, training falls short.'

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media altogether. Maintaining consistency becomes very difficult.

Obviously, a videotape runs at its own pace. If a student wants to review a portion of the tape, it must be rewound until the student finds the exact location.

While video teaching can be extremely interesting and animated, it too is a passive process and, as with stand-up lectures, users must interpret the material later. Much can be lost in the translation.

Computer-Based Training

With its easy access, the computer is a natural choice as an educational medium.

Computer-based training uses self-study techniques involving interaction with the computer. The user signs onto a course from a terminal, usually the same one he uses for his daily work. Material is presented in a series of text and question screens. The user is actively involved in a student-to-computer dialogue. This dialogue takes place through CBT software such as:

- Instructional System (IBM).
- Phoenix (Goal Systems International, Inc.).
- Plato (Control Data Corp.).
- Scholar/Teach3 (Boeing Computer Services Co.).

Among the many advantages to CBT for information center users are the following:

- *It is cost-effective.* There is no need for new equipment; the same terminal and computer serve the user for work as well as training. There are no costs for instructor time, user travel or a training center.
- *It eliminates timing or scheduling problems.* There is no instructor or classroom to schedule, and users can arrange by themselves the most convenient time for taking the course. If a problem arises and the user must be interrupted, he can easily pick up the course where he left off. Since the course is taken on the computer, there is no limit to the number of students who can participate at the same time.
- *CBT courses are easy to maintain.* Updates and customizations can be inserted easily anywhere in the course. And since there is one central copy of the course (in the computer), only one copy need be updated and all new materials are available immediately to all remote users.
- *Courses are self-paced.* They can be designed to let a user select only those topics he needs or wants. At the end of each session, the user can choose to sign off and continue later, go back and review or continue on to the next lesson.

While a user takes the course, the system waits for him to advance from screen to screen, so he need not be left behind. Because the course is interactive, the system can question whether the user has grasped the concepts; if not, it can then provide additional drill and exercise.

- *The training is interesting and effective because the user is actively involved.* The user can be asked to respond to questions and to code statements and commands. Because a CBT course can simulate use of a particular software tool, the user can try his hand at it, and he learns faster.

For all these reasons, CBT is a good start toward fulfilling the promise of the information center.

About the Author

Marsha Seidman is president of CRWTH Computer Coursewares in Los Angeles. She is involved in developing and marketing CBT for the end-user of the information center.

Seidman has more than 15 years' experience in DP and has worked more than 10 years with IBM as a course developer, instructor and system engineer.

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Taking The Mystery Out Of Mips

A look at some of the common interpretations — and misinterpretations — of Mips, and some caveats on using Mips as a CPU performance gauge.

BY MICHAEL J. McHUGH

Beware of Mips! Meaning "millions of instructions per second," the term refers to the number of machine instructions executed by the central processor(s) of a computer system. The problem for hardware planners is that "Mips" is applied loosely, and often incorrectly. As a result, it is far from conclusive as a CPU performance measure.

Mips is most frequently used as a relative measure to compare various computer systems' performance levels, even though at first glance it would appear that a machine's Mips rating is an absolute value for that machine. It is true that a machine that runs at 1 Mips generally executes one million instructions per second, an absolute value. However, the amount of work that can be done by those one million instructions depends upon the machine's architecture and the richness of its instruction set.

For example, most personal computers today are based on 8-bit microprocessors. That is, the basic operand with which most instructions are performed is an 8-bit byte. Large-scale computers have larger word sizes, and their instruction sets normally perform with larger

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operands, such as 32 or 64 bits. Hence, a single add instruction in a 32-bit machine might have to be replaced by four adds in an 8-bit machine.

If Mips is measured relative to the addition of 32-bit values, the larger machine Mips value will be significantly higher than that of the smaller machine adjusted for additional instructions required to perform the operation, even though each machine may execute one million instructions per second. So 1 Mips of a 32-bit machine is not necessarily equivalent to 1 Mips of a smaller machine.

Machines of such radically different architectures as a large mainframe and a personal computer are seldom compared by Mips. However, the concept of varying amounts of work accomplished by machine instructions is valid. Even machines of equivalent architectures may have slightly different instruction sets which affect the validity of a Mips comparison. It is actually possible for a machine to have a *lower* absolute Mips rating than a second machine and yet outperform the second in terms of system throughput.

Cycles per Instruction

But what determines a machine's Mips value? Its elements include the processing steps of instructions, the cycle time, any machine "assists" and the machine architecture.

There are several logical steps involved in the interpretation and execution of a machine instruction in a modern computer. The instruction must be fetched from main memory, the operation code interpreted and any operands fetched from main memory or local CPU storage. The operation must then be applied to the operands, any resultant values must be stored in the specified or implied locations and various status flags or latches must be set depending upon the definition of the instruction.

Certain implicit activities, such as dynamic address translation, incrementing the instruction counter and updating timers, must be carried out at predefined points during the execution of an instruction or asynchronously based upon some other criteria. All of these activities take one or more machine cycles.

Computers are driven by clocking functions. That is, timing control circuits built into a machine determine the exact sequence of events and the duration of those events. Most machines have a basic machine cycle during which a certain unit of work is accomplished, such as the fetching and executing of one microinstruction, the fundamental control programming of most modern computers.

Generally, the number of machine cycles required to complete the execution of machine instructions varies by instruction operation code. Often, classes of instructions can be identified for a given machine, each of which takes the same number of machine cycles. In the very largest machines, the fastest machine instructions execute in a single machine cycle. Smaller machines may require many machine cycles to execute a certain machine instruction.

It is possible for a smaller machine to have a faster cycle time than a larger machine, yet run much slower because of the number of cycles required to complete a machine instruction. Thus, the cycle time of a machine is not always a good measure of the performance. Varying amounts of work are accomplished in a single cycle.

If a hardware monitor is attached to a computer to count the number of machine instructions that complete execution in one second, the machine's absolute Mips value can be determined. But, again, this absolute value may not be entirely relevant to the machine's performance *relative to another machine* unless both machines have the same instruction and assist set.

Types of Assists

It is becoming increasingly common for mainframe computers to provide hardware and microcode "assists" for the operating system and application software. Assists come in several varieties. Most are controlled by the operating system. Some are implicitly invoked, and

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others require explicit machine instructions to execute them. The point of these assists is that a certain function can be implemented directly in hardware or firmware to execute at a speed much greater than that same function would execute if implemented in software, that is, standard machine instructions.

System Architecture

A third problem, more subtle than the issues of instruction set richness and microcode assists, is that the theoretical Mips rate of a machine is not usually experienced in a normal environment. This problem is most noticeable when Mips is measured with an artificial "instruction timing" program that is intended to time individual instructions or predefined instruction mixes.

The machine user experiences a Mips rate less than the theoretical or nominal rate because the machine's instruction execution unit cannot always be executing instructions. That is, the instruction stream often psuses for various reasons when executing a "real-world" instruction mix instead of an optimized artificial mix. The two most common reasons for instruction stream hesitations are memory contention and cycle stealing, but the various speed-up enhancements built into a machine can cause the Mips rate to drop slightly if they are not fully effective.

For example, an instruction timing program might run without any dynamic address translation or run entirely within one page. The normal translation overhead is minimized in this environment.

Another consideration in large machines is the memory cache. This buffer normally consists of very high-speed memory chips which respond much faster than main memory. Most timing programs ignore the fact that they run entirely within cache and therefore suffer little memory contention. When the computer is running an operating system and a production work load, its memory contention characteristics are likely to be very different from when it is running a timing program. Usually architectural and instruction mix considerations cause the machine to run at different absolute Mips values under different work loads.

Multiprocessor Considerations

When one is considering some form of multiprocessor, Mips becomes even more problematical. It is very common to use a "standard" multiplier to arrive at the *effective* Mips value for a multiprocessor based upon the Mips value for the uniprocessor configuration. The most fashionable number today seems to be 1.8; that is, vendors claim that a two-processor configuration gives about 1.8 times the uniprocessor configuration where the uniprocessor is half of the two-processor system.

'A third problem, more subtle than the issues of instruction set richness and microcode assists, is that machine users don't usually experience the theoretical Mips rate in a normal environment.'

Current software and hardware technology does not yield a doubling of performance when a uniprocessor is tightly coupled with a second processor because of the mutual interference caused by the processors. Hardware architectures have improved since the first multiprocessors, and current operating system software has been designed to function in multiprocessing environments. An interference factor of about 10% per CPU is reasonable for current machines, mostly attributable to software interlocks. This factor yields the 1.8 multiplier.

Therefore, if a machine is viewed as a 1-Mips processor, its two-processor version is usually considered a 1.8-Mips processor complex. Each side of the multiprocessor does not

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run faster when it is coupled with the other processor. The effective performance of the multiprocessor *complex* is claimed to be the same as a uniprocessor of 1.8 times the performance of one side of the multiprocessor operating alone.

The problem with this view of multiprocessors is that it is only valid when a sufficiently high degree of multiprogramming is available to the operating software so that both sides of the multiprocessor are busy with useful work most of the time. That is, if a single instruction stream is presented to a multiprocessor, one side of the multiprocessor will remain effectively idle.

In this case, the actual multiplier is very close to 1.0, not 1.8. Conversely, the uniprocessor with a rating of 1.8 will expend 1.8 Mips on the instruction stream. Therefore, applying a "standard" multiplier to a uniprocessor, such as 1.8, to obtain its multiprocessor configuration's performance makes some very significant assumptions about the work load and the ability of the operating system to maintain a performance level of 1.8 times the uniprocessor configuration.

Ratings Inconsistencies

One final problem with Mips ratings — and perhaps most significant for a plug-compatible machine (PCM) vs. IBM or another PCM — is that vendors do not rate their processors in terms of Mips. Vendors normally claim computer performances in terms of multiples of other machines in their line. Therefore, the various machines in the marketplace assume traditional or popular Mips ratings — approximations of absolute Mips values at best. There are consulting firms that give machines Mips values, although this practice is falling out of favor.

The trend today is to define a new rating scale and place all the machines upon it using vendor claims for relative spacing of machines on the scale. It can be very confusing if one tries to correlate the views of machine performance from various sources.

So where does this leave the hardware planner? The planner trying to evaluate the performance of various machines should shy away from Mips. A rough Mips class can be associated with each machine for the purpose of grouping machines of competitive performances together, then Mips ratings should be discarded. A benchmark with the intended work load or a representative subset of that work load is the ideal method of evaluation.

There are other valid methods, such as modeling, but few prospective users take the time to develop accurate work-load models. Too often, time and money constraints force the user to develop a timing program to measure a machine's instruction timings. Sometimes, users attempt some sophistication by structuring the timing program to measure a "representative instruction mix," but these measurements too often ignore such real-world factors as the operating system instruction mix and the true I/O mix in the production environment.

Watch Out

In summary, Mips is misleading if used for anything other than a rough categorization of a processor's performance. Be especially wary of Mips in consideration of multiprocessors. Many of a machine's characteristics will affect its absolute Mips value. Mips ranges encompassing an order of magnitude are not unusual depending on the work loads being tested!

Finally, be extremely skeptical of published or assumed Mips ratings if the method of measurement or calculation is not substantiated. These are often multiple extrapolations from a dubious point of reference, specialized work-load results or mere superstition.

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About the Author

Michael J. McHugh is director of software strategic planning for National Advanced Systems, Inc. in Mountain View, Calif. He has 13 years' experience in the industry.

During his six years with NAS, McHugh has been a systems engineer, manager of customer services and director of technical support.

CDC Adds 'Megamini' to Cyber Family

MINNEAPOLIS — Control Data Corp. has announced an entry-level "megamini" in its Cyber 170 Series 800 processor family.

The single processor Cyber 815 reportedly combines mainframe performance with supermini characteristics within a Cyber-class machine. It is capable of supporting over 1M 60-bit words of main memory, uses the NOS 2 operating system and is software-compatible with the Cyber 825. This means users of previous Cyber machines can run Cyber programs on the new machine without any changes in the 815's operating system or existing applications, the vendor said.

The Cyber 815 has a relative performance roughly 60% of that of the recently enhanced Cyber 825, the vendor added. The system supports the same number of channels as the previously announced Model 825; the only difference is speed and price, according to the vendor. For a difference in price of $175, the 825 processes 1.8 million instructions per second (Mips), while the 815 completes 1.05 Mips.

The Cyber 815 was designed for processing applications in manufacturing, petroleum and mining, education, electric utilities, government and energy, the vendor explained.

A basic Cyber 815 processor with capacity for 262,000 words of main memory, 10 peripheral processors and 12 channels is priced at $195,000. The system can be leased for one year at $7,490/mo. Shipments are scheduled to begin the first quarter of 1983.

Further details are available from CDC through Box O, Minneapolis, Minn. 55440.

Batch IBM Users Get Inputting Tool

FRAZER, Pa. — Cardamation Co. has introduced a batch inputting system that reportedly allows batch IBM computer users to upgrade to the firm's System/38 minicomputer without major investments in program conversion.

The CR500/38 features a 500 card/min, 80-col. reader plus communications software. Existing applications may run on the System/38 as is, permitting interactive applications to be implemented at the user's convenience, the vendor said.

List price of the CR500/38 is $9,450 with 36- to 60-month leases available at $375 and $266 respectively, Cardamation said from 446 Lancaster Ave., Frazer, Pa. 19355.

Two-Dimensional, Isometric Drawing

IBM Unveils Drafting System

RYE BROOK, N.Y. — A self-contained computer-based drafting system that reportedly provides a complete range of drafting functions for production of two-dimensional and isometric drawings has been unveiled here by IBM. The system is aimed at first-time drafting system users, an IBM spokesman said.

The IBM 7361 Fastdraft System features an IBM 7361 graphics processor unit, one or two IBM 3251 Model 2 graphics display stations, an IBM 3101 Model 10 display terminal console, a large-format IBM 7374 color plotter and specialized software, the vendor said. It also has a light pen for inputting and manipulating data represented on the unit's CRT screen.

The color plotter can produce drawings in sizes up to 24½-in. wide on standard drafting media, according to the vendor.

The Fastdraft system can be purchased for $97,890, which includes the processor, two 3251 display stations, one 3101 display terminal and the color printer. The system is scheduled for release in May, and further details can be obtained from IBM at 900 King St., Rye Brook, N.Y. 10573.

Intergraph Graphics System Targets Users of VAX-11/730s

HUNTSVILLE, Ala. — Intergraph Corp. has unveiled a graphics system designed for users of Digital Equipment Corp.'s VAX-11/730 superminicomputers.

The Intergraph 730 Computer Graphics System includes 2M bytes of memory and can be configured with either a color or a monochromatic Intergraph CRT workstation, the vendor said. The product is reportedly offered as an entry-level system into VAX-11-based graphics processing.

As a stand-alone system, the Intergraph 730 enables users to create, manipulate, display and plot any form of graphics information and simultaneously to manage and to present data associated with the graphics presentations, the vendor said.

The system is said to be totally software compatible with other VAX-based systems that are offered by Intergraph, which allows it to be used as a node in a distributed processing environment.

The base price of the Intergraph 730 is $145,000 with a monochromatic workstation and $165,000 with a color workstation. Deliveries are slated to begin in April. Intergraph said from 1 Madison Industrial Park, Huntsville, Ala. 35807.

Full Color Spectrum Plotter Out

SANTA CLARA, Calif. — An electrostatic color plotter that reportedly produces the full color spectrum with translucent toners in magenta, yellow, cyan and black has been unveiled here by Versatec, a Xerox Corp. company.

The Versatec color plotter uses Versatec 42-in.-wide roll paper and can produce full-color E-size drawings in eight minutes or a black-and-white drawing in less than 90 seconds, the vendor said. Resolution produced by the unit is reportedly 40,000 points per square inch.

This plotter utilizes standard interfaces also offered by Versatec.

In addition, monochrome plotting reportedly requires no change in interfacing hardware or software, the vendor explained.

The color plotter will be available in the second quarter of 1983 for $98,000.

Versatec is located at 2805 Bowers Ave., Santa Clara, Calif. 95051.

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Consulting Service Packages From CDC Target IBM Users

MINNEAPOLIS — Control Data Corp. has announced five packaged consulting services in the areas of computer storage capacity management and performance analysis for users of medium- to large-scale IBM and plug-compatible systems.

The five new services, which are each available separately, are called Vital Signs, Storage Hierarchy Analysis, Configuration Analysis, Contention Analysis and Work Load Analysis and Forecasting.

The Vital Signs service reportedly provides a snapshot look at current systems performance levels, including usage of the CPU, channnels, memory, paging and I/O devices.

Storage Hierarchy Analysis helps users choose the most effective placement of data sets among various existing storage media, the vendor said.

Configuration Analysis compares the performance of multiple direct access storage device (Dasd) configuration alternatives and provides a subsystem performance baseline to highlight existing bottlenecks, according to the vendor.

The Contention Analysis reportedly evaluates the performance of Dasds to identify problem volumes and the sources of performance degradation at the data set level, the vendor reported.

The last service, Work Load Analysis and Forecasting, evaluates current work loads, peak periods, resource capacity vs. usage and other factors involved in capacity planning, the vendor explained.

Prices for the various services begin at $3,000.

Further details are available from CDC at 2200 Berkshire Lane N., Minneapolis, Minn. 55441.

McAuto Unveils Systems For Cell, Mechanical Design

ST. LOUIS — An interactive design system that reportedly can be used to design robot-controlled manufacturing cells 75% faster than conventional methods, and an interactive graphics solid modeling system for mechanical design, have recently been unveiled by McDonnell Douglas Automation Co. (McAuto).

The first product, Positioner Layout And Cell Evaluator (Place) reportedly allows robots to be used in shorter production runs in machining, welding and assembly applications. It runs on Digital Equipment Corp. VAX-11 series of machines. Place incorporates both computer simulation and animation to replace engineering sketches and manual methods of positioning a robot and fixtures within a manufacturing cell. Place allows optimum cell layout, visual collision detection, robot evaluation and selection and tooling analysis.

The user interface to Place is through the new R-100 graphics design station, which is equipped with a vector refresh terminal and devices for dynamic picture control and controlled animation of the displayed objects.

McAuto also markets the Unigraphics computer-aided design and manufacturing (CAD/CAM) system with which the geometric models of the robot's arm and hand, conveyors, fixtures and other work cell devices are designed. These three-dimensional models are transferred to the robotics cell files in Place via a software link and displayed on the R-100 graphics design station, where they can be manipulated by the user, the vendor explained.

Links from Place to other CAD systems through the Interactive Graphics Exchange Specification standard will be provided if desired. When Place is used with Unigraphics, both systems can operate simultaneously on the same VAX-11 computer, the vendor claimed.

A Place system for the VAX-11/750 costs $130,000, and for the VAX-11/780, it costs $135,000, the vendor reported.

The second product, McAuto's Unisolids interactive graphics solid modeling system for mechanical design, reportedly can be linked on the same computer to the company's integrated CAD/CAM system, Unigraphics, for drafting and numerical-control machining applications.

Unisolids reportedly features a new graphics modeling technology — constructive solid geometry — and is based on the Padl-2 software developed by the Production Automation Project at the University of Rochester, N.Y.

This product operates on VAX-11 systems and Data General Corp. MV series of 32-bit superminicomputers. Like Unigraphics, this product is a tutorial, menu-driven system.

Unisolids is priced at $50,000 on a VAX-11/750 or MV/6000 computer and $60,000 on a VAX-11/780 or MV/8000. Further details are available from McAuto through P.O. Box 516, St. Louis, Mo. 63166.

Iomega Cuts Cost Of Its Disk Drive

RIVERDALE, Utah — Iomega Corp. has announced a reduction in the price of its Alpha-10 10M-byte disk drive.

The Alpha-10 subsystem, which includes a disk drive and controller, is now priced at $1,745, a 27% reduction. Up to three additional slave drives may be daisy-chained to the subsystem at the price of $895 each, down 36% from the previous list. The price of the Alpha-10's 10M-byte cartridges has also been dropped $10 and now cost $50 each.

Iomega also reduced the price of its Alpha-10 system Evaluation Kit by $300. The kit now costs $1,200.

More information on the Alpha-10 series is available through the vendor at 4646 S. 1500 West, Riverdale, Utah 84403.

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Image-Processing Subsystem

Imageview Runs on DEC

BILLERICA, Mass. — Lexidata Corp. has introduced an image-processing subsystem that reportedly can be used to manipulate and display image and pixel data for system development.

The Imageview system was designed to run on Digital Equipment Corp. VAX/VMS and PDP-11/RSX computer systems and combines software, firmware and hardware to provide users with a visual foundation for system development.

The system allows the user to manipulate visual data by partitioning the display memory into a series of independent work spaces called Virtual Images. These Virtual Images reportedly allow the user easily to access the display memory, because once defined they are referenced symbolically so that the user does not need to work with the absolute positions of the Virtual Images in memory.

Subsequently, operations such as arithmetic, Boolean or logical can then be performed between images, with pixel normalization and translation performed locally by Imageview, the vendor explained.

The price for an Imageview system combining 640-pixel by 512-pixel display resolution with eight planes of memory and the display processor is $16,200. This system is expandable to 12 planes of memory and can display up to 4,096 colors simultaneously. A 1,280-pixel by 1,024-pixel system with four planes of memory starts at $21,300. This system can be expanded to eight planes and can display up to 256 colors, the vendor said.

Further details can be obtained from Lexidata Corp. at 755 Middlesex Tnpk., Billerica, Mass. 01865.

Band Printer Offers Options

MALDEN, Mass. — A 750 line/min band printer has been unveiled by Data Printer Corp.

The Model 3751 is said to feature quiet cabinetry, casters, spool-to-spool ribbon, rear control panel and diagnostics. Optional features include forms-length selector switch, format load, paper puller, elapsed-time meter and digital line counter.

The unit costs less than $10,000 from the firm at 99 Middlesex St., Malden, Mass. 02148.

Adapter Module Fits DEC LSI-11s

ORANGE, Calif. — MDB Systems, Inc. has announced a printer long-line adapter module, the MDB/MLSI-PLLA11, for systems based on Digital Equipment Corp.'s LSI-11 central processor.

The MDP/MLSI-PLLA11 is a dual-size module that provides long-line differential capability to MDB's printer controllers. The unit allows users to place printers up to 3,000 feet from the CPU, the vendor said.

The unit costs $300, the vendor said from 1995 N. Batavia St., Orange, Calif. 92665.

PMI Rebuilds IBM, NCR Drives

LORTON, Va. — IBM 3340 and NCR Corp. 6590-0201 Winchester-type data modules reportedly can be repaired and remanufactured to original manufacturer specifications by Precision Methods, Inc. (PMI).

The modules are removable disk packs for IBM and NCR Corp. equipment.

PMI does the job at its Salem, N.H., facility. It costs $800 for IBM and $900 for NCR units, a spokesman said from 8825 Telegraph Road, Lorton, Va. 22079.

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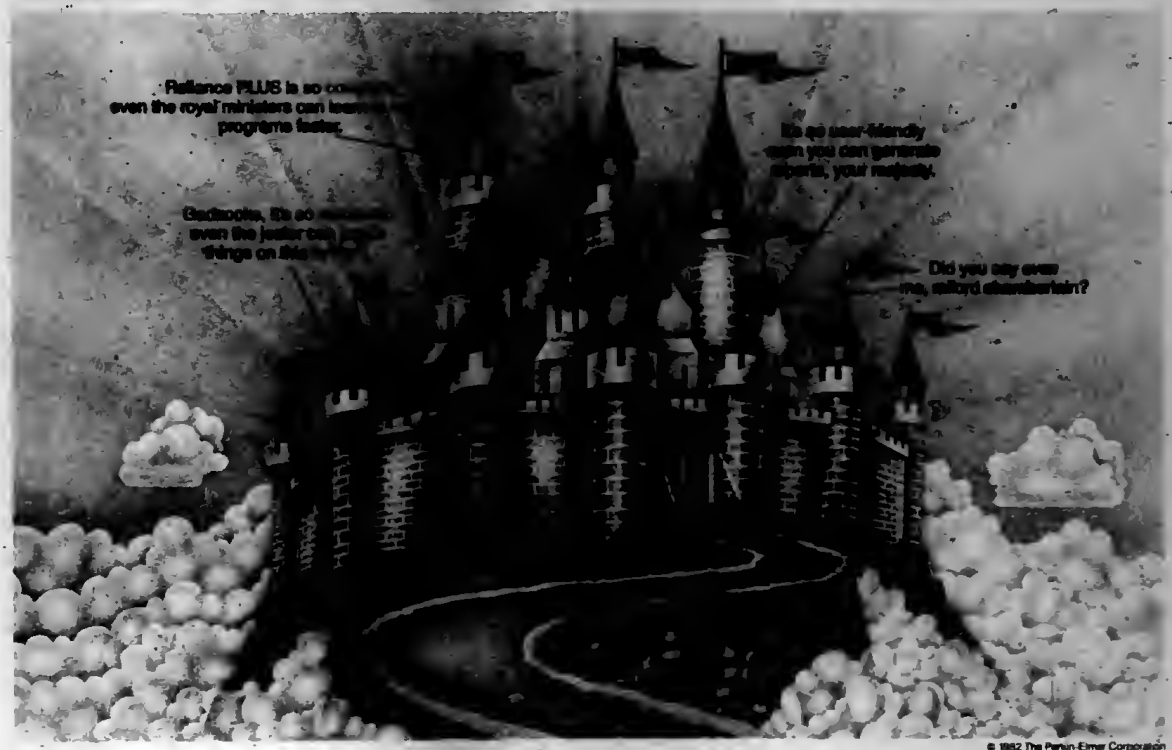

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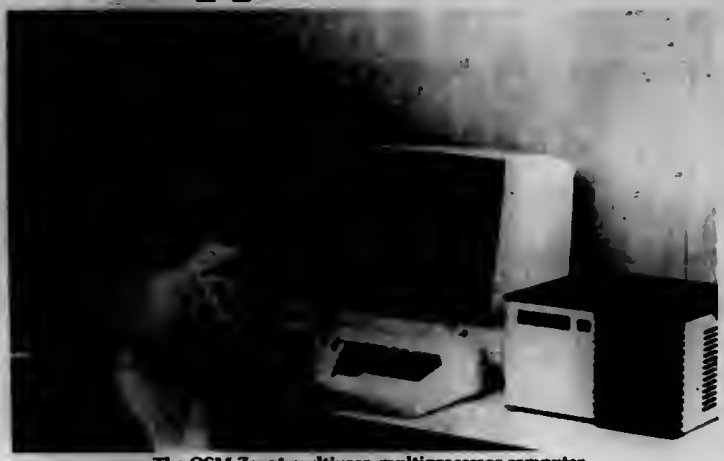
Incorporates OSM's Muse

Multi-CPU Micro Supports Four Users

SANTA CLARA, Calif. — OSM Computer Corp. has recently unveiled Zeus4, a multiprocessor microcomputer that can reportedly handle up to four users.

The Zilog, Inc. Z80-based system incorporates OSM's Multiuser System Executive (Muse) operating system to support up to four users simultaneously in what is said to be a totally segregated operating environment fully compatible with Digital Research, Inc.'s CP/M. Zeus4 occupies less than one cubic foot of desk space and features four separate modules: a Winchester disk with up to 19M bytes of storage capacity, a switching power supply, floppy disk and the system/user board module.

The system/user board module contains the two-board Master Processor and a separate user card with 10 sq in. of circuitry for each user, the vendor explained. The user board is factory-configured for up to four physically segregated CPUs, each with 64K bytes of random-access memory (RAM) and two serial ports, providing a separate computer for each user. A fully configured system has a total of 10 serial ports and two parallel ports, the vendor said.



The OSM Zeus4 multiuser, multiprocessor computer

Each user controls a dedicated Z80A processor with optional parity, 64K-byte memory for CP/M-compatible applications, an erasable programmable read-only memory and two RS-232C I/O ports. A master Z80A processor module controls

(Continued on Page 70)

Nelma Data Unveils Z80A-Based Micro

MISSISSAUGA, Ont. — Nelma Data Corp. has introduced a personal/business computer based on Zilog, Inc.'s Z80A microprocessor.

The Persona comes with a 12-in. green phosphor CRT screen, 64K bytes of programmable memory, two 160K-byte disk drives, detached keyboard including numeric key pad and 11 program function keys, serial and parallel ports, Digital Research, Inc.'s CP/M Version 2.2 operating system, plus Callan Data Systems, Inc.'s Wordstar and Calcstar software packages. Microsoft, Inc.'s MBasic is available as an option, the vendor added.

This product is priced at under $3,000, the vendor said from 5170A Timberlea Blvd., Mississauga, Ont., Canada L4W 2S5.

Unibus-Compatible Version Of RLX3010 Disk Drive Out

NATICK, Mass. — Charles River Data Systems, Inc. has introduced a Unibus-compatible version of its RLX3010 Digital Equipment Corp.-compatible disk drive.

Like the previous version, the RLX3010U incorporates both a 31.2M-byte Winchester disk and a 10.4M-byte removable-cartridge Winchester disk. The removable Winchester provides backup and additional on-line storage and offers solutions to problems inherent in other Winchester backup methods, the vendor claimed.

The two Winchester drives in the RLX3010U are mounted on separate spindles, which can be operated from the Unibus as separate peripheral drives or as an integrated storage system. The entire 41.6M-byte capacity of the system can be used for on-line storage of data and programs, or the 10.4M-byte removable-cartridge drive can be used alone for high-speed, file-oriented backup or program swapping, the vendor said.

List price for the dual-Winchester RLX3010U is $12,250. Further details are available from the vendor at 4 Tech Circle, Natick, Mass. 01760.

Box Micro Features CP/M

WESTMINSTER, Calif. — Zax Corp. has introduced a Zilog, Inc. Z80A-based microcomputer featuring Digital Research, Inc.'s CP/M operating system, a built-in erasable programmable read-only memory; two 8-in. double-density, double-sided floppy disk drives; and 64K bytes of random-access memory.

Called the Box, it also comes with four RS-232C serial ports, the vendor said.

The Box is priced at $5,995, a spokeswoman for the vendor said from 8311 Westminster Ave., Westminster, Calif. 92683.

'Sequel' Users Get Tape Backup

IRVINE, Calif. — Microdata Corp. has announced a streaming tape backup capability for its Sequel large computer system, to replace the system's standard reel-to-reel tape drive.

A spokesman said the drive operates at a maximum speed of 100 in./sec with a density of 1600 bit/in.

The drive costs $3,000 from Microdata at 17481 Red Hill Ave., Irvine, Calif. 92714.

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Boston-Danvers, MA	March 15
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Roanoke, VA	February 23
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Rye, NY	February 24
Sacramento, CA	February 1
St. John, NB	February 16
St. Louis, MO	February 24
St. Paul, MN	March 2
Salt Lake City, UT	March 17
San Antonio, TX	February 22
San Diego, CA	February 23
San Francisco, CA	January 18
San Jose, CA	March 1
Savannah, GA	February 8
Seattle, WA	January 25
Shreveport, LA	March 10
Somerset, NJ	February 15
South Bend, IN	January 27
Springfield, MA	March 1
Springfield, MO	March 30
Stamford, CT	March 9
Syracuse, NY	February 9
Tallahassee, FL	March 1
Toronto, ONT	January 20
Toronto, ONT	March 29
Troy, MI	March 30
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Micro Upgrade Provides Corporate, Local DP

TREVOSE, Pa. — Delta Data Systems Corp. has unveiled an upgraded version of its TC2830 II microcomputer system, which is designed to provide corporate and local data processing as well as a full range of business computing capabilities.

The new Micro Manager is a Digital Research, Inc. CP/M-based system featuring dual processors. The system reportedly communicates with mainframe computers, and its built-in CP/M board allows it to run a variety of data processing programs as part of a network or independently, either at the local level or while under the control of the corporate DP manager, the vendor said. Examples of the system's capabilities are word processing, electronic spreadsheets and data base management.

The product supports a range of peripherals including 8-in. dual floppy disk drives with 2.4M bytes of storage as well as dot matrix and letter-quality printers. Networking systems utilizing 10M- to 40M-byte Winchester hard disk technology can be established for distributed data processing as well as on-site and remote locations, the vendor noted.

The Micro Manager is base-priced at $7,495, the vendor said from 259S Metropolitan Drive, Trevose, Pa. 19047.

P-Series Printers Added to Line

STAMFORD, Conn. — Digital Associates Corp. has added Printronix, Inc.'s P-Series graphics/line printers to the firm's printer line.

The Printronix printers reportedly can be interfaced to a Hewlett-Packard Co. HP 1000, 2100, 3000 1/II/III, 30/33, 30/34 or 30/64 CPU in the parallel mode as system printers. Compatibility with other minicomputer systems, including Digital Equipment Corp. and Data General Corp. is also available.

The 300 line/min model with interface costs $8,995, and the 600 line/min model with interface costs $11,450 from the firm at 1039 E. Main St., Stamford, Conn. 06902.

Adac Offers Bus Casing

WOBURN, Mass. — An I/O bus enclosure that features 22-bit addressing and fan-failure protection has been introduced here by Adac Corp.

The Digital Equipment Corp. LSI-11 bus enclosure, called System 2200, reportedly provides plug-in ease of I/O configuration for data acquisition and control system designers and users. Engineered for LSI-11/2, 11/23, or the new 11/21 Falcon microcomputer, System 2200 has backplane, power supply, front access and a 13-slot card cage, all in a 7-in. by 9-in. package, the vendor said.

The product is available in master and slave versions and with half-rack width companion units Model 2200TU, single- or dual-tape cartridge system and Model 2200CR user-programmable annunciator CRT terminal. Model 2200TU, 2200CR or a slave unit can be connected with System 2200 for standard 10-in. rack mounting or desktop use, the vendor said.

System 2200 costs under $1,200 from 70 Tower Office Park, Woburn, Mass. 01801.

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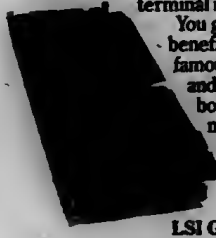
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These software tools work together or separately to bring new efficiency to the V-8500 II Series and VRX. To find out how you gain better access to your files — and cut programming costs and delays — call your local NCR office. Or call 1-800-CALL NCR (in Ohio, 1-800-543-4470).

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Series of Quadram Memory Products Serve IBM's Personal Computer

NORCROSS, Ga. — Quadram Corp. has announced a series of memory products for the IBM Personal Computer.

The Quadboard II reportedly combines two RS-232C asynchronous serial ports, clock calendar chronograph, memory expansion up to 256K bytes, random-access memory (RAM) drive and spooler on a single board. Quadmaster software is included, containing the Quadram drive for simulating a floppy disk drive in Quadboard II memory, spooler, clock routines, diagnostics and utilities.

Quadram has also announced special offers to purchasers of the original Quadboard until Feb. 15. Buyers of the six-function, 256K-byte Quadboard will receive a 64K-byte memory board free of charge or a 192K-byte memory board for $44. The offer does not apply to the Quadboard II, a spokesman said.

Both products range from $595 for 64K bytes of RAM to $995 for 256K bytes of RAM.

Quadram also announced Quad 512+, a multifunction memory board that includes up to 512K bytes of RAM, an RS-232C asynchronous serial port, a RAM disk and spooler.

The board supports IBM communications software and has eight 64K-byte memory banks, which may be addressed individually by a dip switch, the spokesman said.

Quad 512+ is priced from $475 for 64K bytes of RAM to $1,295 for 512K bytes of RAM. All products are available from 4357 Park Drive, Norcross, Ga. 30093.

Micro Turnkey Aimed At Small Publishers

CHICAGO — A microcomputer-based turnkey fulfillment system aimed at smaller publishers has recently been introduced here by Sunward Systems, Inc.

Fulfillment I, which is based on the IBM Personal Computer, reportedly can support any number of publications with combined circulations up to 100,000, either in a single-publication or multipublication mode.

This product automatically detects duplicate subscriptions and entries and provides cash receipts and accounts receivables listings broken down by source code, according to the vendor. It also automatically posts subscription payments and renewals, eliminating the need for duplicate mailings, the vendor said.

The system produces mailing labels in either four-up Cheshire or one-up format.

Fulfillment 1 costs $15,595, the vendor said from 655 W. Irving Park Road, No. 5203, Chicago, Ill, 60613.

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Controller Fits S-100s

MASPETH, N.Y. — GSR Computers, Inc. has announced a universal floppy disk controller, the UFDC-I, for S-100 systems.

The unit can connect up to four floppy disk drives in any combination of 5¼-in. or 8-in. drives with Ansi-standard interfaces. The unit synchronizes the processor to disk transfers by using wait states. Data transfers, status checking, drive select, density, disk side and wait-state circuitry can be selected by external I/O control.

The unit costs $325 for an assembled model and $295 for a kit from the vendor at 60-10 69th St., Maspeth, N.Y. 11378.

Micro Serves Four Users

(Continued from Page 65)

the shared resources of floppy and hard disk storage, floppy disk controller, direct memory access interface to the hard disk drive and a real-time clock with battery backup.

The Zeus4 also features self-diagnostics and has an average mean time between failure estimated at 5,000 hours, the vendor reported.

The vendor's Muse operating system incorporates all the standard features of CP/M software, while adding file management capabilities such as multiuser file sharing, password protection, print spooling, data security and autosearching.

The basic single-user Zeus4, with a Z80A microprocessor, 64K bytes of RAM, 6.4M bytes of 5¼-in. Winchester disk storage and a 250K-byte, 5¼-in. floppy disk drive, lists for $4,595.

This product is available for immediate shipment from the vendor at 2364 Walsh Ave., Santa Clara, Calif. 95051.

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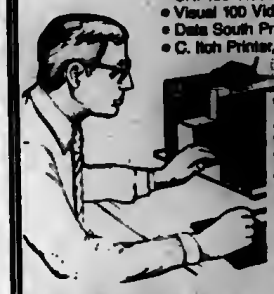

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Two Voice Mail Products Debut for PBXs

• AT&T

NEW YORK — AT&T has introduced a voice mail capability for its Dimension private branch exchange (PBX) that reportedly allows users to record, transmit or receive voice messages.

Called Voice Store and Forward (VSF), the system also has the ability to broadcast a message to several hundred people and features a message-waiting lamp that immediately notifies a user that a message is waiting. A Bell spokesman said internal studies had shown that use of a voice mail system is increased by as much as 40% when the lamp is included.

In practice, VSF on a Dimension can be used in any situation where noninteractive communications is preferred — that is, when a party is unavailable, the message must be sent rapidly to several people, or when the caller wants to leave a message without talking to anyone.

Any Touch-Tone telephone, anywhere in the world, can be used to access the system and

(Continued on Page 72)

• Rolm Corp.

SANTA CLARA, Calif. — Rolm Corp. has unveiled Phonemail, a voice mail system designed for use on its CBX private branch exchange (PBX) that reportedly combines the capabilities of telephone answering, message notification and voice store-and-forward into one integrated package.

Telephone answering is an important feature of the system. Whenever a user's telephone is busy, unattended or in "do not disturb" mode, both internal and external callers are automatically forwarded by the CBX into the Phonemail system.

The system then plays either a standard greeting or the user's individual greeting and directs callers to leave a voice message. The advantage of telephone answering is that once callers find they cannot reach the Phonemail user, a separate call is not required to leave a voice message, a Rolm spokesman claimed.

Because of its integration with the CBX, the Phonemail

(Continued on Page 72)

For Turnkey, Stand-Alone Use

Electronic Mail System Unveiled

ST. PAUL, Minn. — 3M Corp. has unveiled an electronic mail system designed for turnkey, stand-alone use in medium-volume business operations.

The Whisper Electronic Message Exchange permits messages, most types of sales and service orders, as well as production and shipping orders, to be handled more quickly with more accuracy and with less cost than with other methods, the vendor claimed.

It consists of a network of low-cost Whisper Writer teleprinters or other terminals that send and receive messages from a microcomputer central controller over telephone lines. The Motorola, Inc. 68000 microprocessor-based computer uses Charles River Data Systems, Inc.'s Unos operating system and BBN Computer Corp.'s Informail electronic mail software.

The Whisper system was designed to reduce costs by reducing order processing time, particularly the labor required to transcribe orders from one format to another.

Rental fees for the system start at $1,500/mo, 3M said from Department BC82-18, P.O. Box 33600, St. Paul, Minn. 55133.

USSSI Agrees to Grant Wang Labs Satellite Transponder Capabilities

LOWELL, Mass. — Wang Laboratories, Inc. has reached an agreement with United States Satellites Systems, Inc. (USSSI) that will result in Wang obtaining satellite transponder capabilities from USSSI.

USSSI plans to launch two satellites in 1986. Major Wang accounts will reportedly be able to own or participate in their own national communications networks of Wang-based systems — complete with voice, data, video and text transmission capabilities.

The two satellites will offer high-frequency K-band capabilities, which means users will be able to employ inexpensive ground stations in congested city areas, a spokesman said.

Under terms of the deal, Wang acquires a minority ownership in USSSI, he noted. Wang is located at One Industrial Ave., Lowell, Mass. 01851.

*Packages Run With CT*OS*

PASADENA, Calif. — Compu-Tome, Inc. has introduced a spelling package and an electronic mail package to run in conjunction with the company'a CT*OS word processing package.

The CT*OS apelling corrector provides checking of apelling in lengthy documents at 80 word/sec. The package works with a dictionary of over 80,000 words, a spokesman said. The spelling package is available for $500 for a single-CPU license.

The Executronic Mail package operates under the Digital Equipment Corp. protocols of Decnet. The structure of the system is based on a routing alip format and requires an active response from both the sender and the receiver, the spokeman said.

The base price for the mail package is $18,000, from Compu-Tome, 234 E. Colorado Blvd., Pasadena, Calif. 91101.

E-Mail Fits TSV 400 Micro

NEW YORK — Videodial, Inc. has introduced electronic mailbox and directory service software packages for the French Telesystemes TSV 400 videotex micro turnkey, which Videodial is marketing in this country. The system was designed for office and factory management, government applications, tourism, travel and convention functions.

There are two versions of the electronic mailbox facility. With one, the user must be authorized and catalogued in a file to access the system. For the other, anyone can obtain access, using the last name of at least one person on the system.

The Corporate Electronic Directory is equipped with two conversational utility packages. One is used to create the client's system, including the definition of each criteria, number of allowable questions and chaining of questions. The other is for data entry and updating functions, executed on-line. on-line.

The turnkey system ranges in price from $80,000 to $120,000 from Videodial, 15 Columbus Cirtle, New York, N.Y. 10023.

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The Televideo Model 925 offers ergonomic design, detachable keyboard and editing capabilities. The 950 adds programmable keyfunctions. Choose the basic Model 910 for maximum economy. All models feature Televideo's eye-easy green phosphor screens.

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Stand-Alone WP System Handles Heavy Data Load

SANTA MONICA, Calif. — Compucorp has announced a high-end stand-alone word processing system, designed to handle large amounts of data.

Compucorp 799 is said to combine more than 22,000 pages of hard disk storage, plus a 7,500-page high-speed tape cartridge and a 300-page flexible disk storage unit with an extended function keyboard and 24-line CRT display in a multimodule desktop ensemble.

The system was designed for installations with high levels of activity or large data bases and where data integrity is of particular importance. The 799's high-speed backup tape cartridge can eliminate as many as 90 standard floppy diskettes.

The system costs approximately $25,000 from the firm, headquartered at 2211 Michigan Ave., Santa Monica, Calif. 90404.

Document System Fits HP 3000

HANOVER, N.H. — A document indexing and retrieval system for the Hewlett-Packard Co. HP 3000 minicomputer has been announced by Lupfer & Long, Inc.

Called Textract, the package reportedly creates a special document index for information including title, date, author, abstract and key word. Documents can be retrieved based on key words and other selection criteria, the company claimed. The package is menu-driven and utilizes HP's V/3000 data base management system to communicate with various screens.

A perpetual license fee costs $10,000, a spokesman said from Suite 200, 8200 Greensboro Drive, McLean, Va. 22102.

Rolm Unveils Phonemail for CBX

(Continued from Page 71)

system also provides message notification. When messages are waiting in their "voice mailboxes," system users are automatically notified by a message waiting light on the telephone or by a distinctive tone in place of a regular dial tone.

Voice store-and-forward messaging is based on the process of digitizing analog speech and storing it on magnetic disks for later retrieval. The technology allows users to leave voice messages for others and to retrieve the stored voice messages waiting for them in the voice mailboxes.

The result is a reduction in quantity, duration and cost of telephone calls, as well as an improvement in user productivity, the spokesman said.

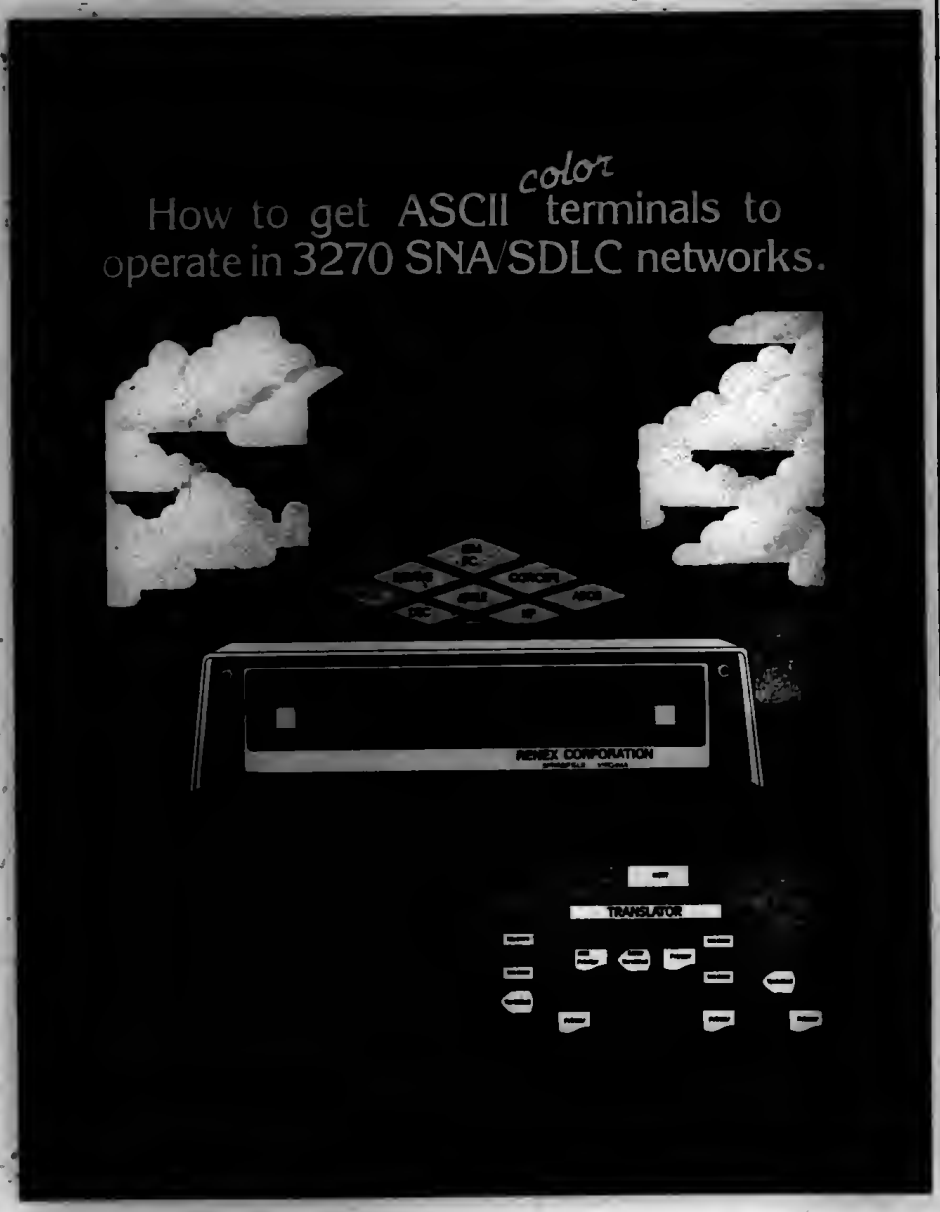
There are a number of options with the system. Users hear them in verbal prompts over the telephone and choose among them by pressing telephone keys. When users elect to listen to messages in the mailboxes, the system announces the number of messages waiting, and for each message it plays a header giving the date, time and extension of the caller and then plays the message itself.

After listening to each message, Phonemail users can save or delete the message, reply to it or forward it with a comment appended to other users.

The Phonemail system consists of an application processor tied to the CBX. Messages are stored on Winchester disks. Users reportedly can call the system any time of the day or night from virtually any location, accessing the system with standard push-button telephones, Rolm Flashphones or Rolm Model ETS 100A electronic telephones.

The system is available in various configurations. It can have eight or 156 channels and up to seven disks for message storage. Hardware costs start at $50,000. Software may be licensed on a monthly basis for $600 or on a one-time basis for $20,000.

Phonemail will be available in June, Rolm said from 4900 Old Ironsides Drive, Santa Clara, Calif. 95050.



Dimension PBX Gets Voice Mail

(Continued from Page 71)

begin recording or retrieving a message. The user can also send a message at a time and date in the future or instruct the system to call the intended party to deliver an urgent message, the spokesman said.

To receive a message, the user dials the system and enters his password. The system then plays back the recorded messages on a last-in, first-out basis. When all the messages have been heard, the message-waiting lamp is turned off. Each individual's password provides system security by preventing unwarranted users from accessing the system.

A 200-user system leases for $4,680 per month on a two-year variable-term payment plan. On a four-year plan, it costs $4,250 per month. A 600-user system leases for $7,169 monthly on a two-year plan and $6,517 over four years. A 1,000-user system leases for $9,039 for the two-year plan and $8,218 over four years. VSF will be available in May.

Namesake Company Files Suit

Paul Magnuson Accused of Secrets Theft

By Jeffry Beeler
CW West Coast Bureau

SAN JOSE, Calif. — Magnuson Computer Systems, Inc. co-founder Paul H. Magnuson has been charged with violating California's computer crime law and stealing trade secrets from the company that bears his name.

The theft allegedly occurred this fall a few months after Magnuson, 39, had left the IBM-compatible mainframe supplier to form a second electronics vendor known as Prodigy.

In a criminal complaint filed in municipal court here on Dec. 2, Magnuson and a second suspect have been accused of gaining unauthorized access to the mainframe manufacturer's corporate computing system and then transferring part of its proprietary contents to Prodigy.

The supposed stolen materials included printed-circuit board layout data, an engineering change order facility and a system for automating printed-circuit board design, according to court documents.

Valued at more than $100,000, the trade secrets reportedly were found on Prodigy's premises during a Santa Clara County Sheriff's Department's "search" of the infant company's central computing system. The searchers included Magnuson Computer employees Tom Haggard and John Bean, who helped law-enforcement investigators log on to Prodigy's system and

(Continued on Page 74)

Competition for Distributors Forcing New Market Strategies

Photo by P. Bochner

Byte Industries, Inc.'s giant display at Comdex/Fall '82

By Bill Laberis
CW Staff

LAS VEGAS — Independent sales networks appear to be maturing rapidly enough to handle the explosion in low-end business computing. However, there is keen competition for top-line distributors, provoking vendors to adopt different strategies for channeling their wares to the end-user marketplace, according to vendors attending Comdex/Fall '82 here recently.

CW at Comdex

"It's a matter of supply and demand, and the supply of really good distributors just isn't that vast," a vendor's representative remarked. "As far as the end user goes, I'm not so sure he's going to see how this situation makes a heck of a lot of difference. He's going to end up with a huge selection of small systems, each one claiming to be the best in one way or another."

Appropriately enough, those remarks were passed at a trade show where few end users were found among the over 40,000 attendees. Comdex is a middleman's show, although one that featured more exhibitors (1,100) and perhaps more product introductions than are announced during the annual National Computer Conference.

According to Calvin Lee, president of

(Continued on Page 80)

Refocused CCA Gains Visibility In Data Base Mart

By Lois Paul
CW Staff

CAMBRIDGE, Mass. — When a representative from Computer Corp. of America (CCA) visits a new prospect, he no longer has to spend the first half hour of the meeting explaining what CCA is and what its products are.

After spending 17 years primarily as a research and development (R&D) organization focusing on data base technology, CCA decided last year to assume more of a visible presence in the commercial data base marketplace. After all, the firm has an established IBM-compatible data base management system (DBMS) — the Model 204 — as well as Comet/204, a pioneer electronic mail system. In addition, the firm has several new products in the wings that it plans to introduce over the next two years, including an Ada-based distributed DBMS.

"We feel the time has come for us to get some recognition. We have to have a more visible kind of presence," Dr. James B. Rothnie Jr., executive vice-president of CCA, explained.

To accomplish this switch, CCA reorga-

(Continued on Page 78)

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John Beall & Company, Inc.

Magnuson Files Charges Of Theft Against Namesake

(Continued from Page 73)

scan its data base for suspicious materials.

"During the search, Paul Magnuson kept stating he had no idea who or how the information got into the [new company's] computer banks," Sheriff's Department Detective Pat Moore said in one of the court documents dated Dec. 2.

In addition to Magnuson, other principals named in the trade-secrets theft case include Kevin E. Anderson, 31, and Samuel Anthony Dottle, 37, both former Magnuson Computer employees, who recently left the company to join Prodigy.

All three suspects have been charged with conspiracy, trade-secrets theft and possession of stolen property. Magnuson and Anderson also face additional charges of computer crime, bribery to obtain trade secrets and solicitation to commit "certain crimes," the complaint said.

An investigation into the Prodigy employees' alleged misdeeds began on Oct. 22 shortly after Magnuson Computer staff member Guy Waters spotted four printouts indicating that someone had retrieved computer-stored information concerning the mainframe vendor's printed-circuit boards. Waters thought the printouts "unusual," the court documents said, "because the coding indicated that the information was retrieved by Sam Dottie or someone using his code number, and the information ... was similar to the information that was asked of him (Waters) four to six weeks [earlier] when he went for a job interview [at] Prodigy."

The interview resulted in a job offer for Waters, who was allegedly asked by Magnuson to bring with him information about several purported Magnuson Computer trade secrets, including the design automation and engineering change-order systems. Waters considered the request "unethical" and eventually declined the job offer, the documents said.

As a result of their investigation, law-enforcement authorities also reportedly uncovered these findings:

- During the late evening hours of Oct. 14, Dottle signed in at Magnuson Computer's facility and used the company's processor for about 45 minutes to enter two systems and produce four magnetic tapes, which he later took from the building.
- Three days later, Dottle again logged into the Magnuson Computer facility during the late evening and reentered the firm's central mainframe for about 45 minutes to generate an additional four reels of magnetic tape.

The second late-night visit came just one day before Dottle announced his resignation from Magnuson Computer and about three weeks before he took a new job at Prodigy, the court papers state.

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Intel Plan Offers Lease/Purchase

SANTA CLARA, Calif. — Intel Corp. has announced a lease/purchase plan that offers one-, two- or three-year options for its newest development systems and can be altered later to include system upgrades. Intel claims the plan will make it easier for both large OEMs and smaller users to acquire a system to suit their particular needs.

Because each company can choose the lease period that best fits into its product development cycle, the capabilities of Intel's state-of-the-art development systems become immediately accessible to most users, the company claimed.

Additional information is available from Intel Corp., 3200 Lakeside Drive, Santa Clara, Calif.

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CCA Enters Marketplace After Years in R&D

(Continued from Page 73)

nized in early 1982 and, for the first time, developed a marketing function. Admitting that his firm is behind its DBMS competitors in terms of recognition, Rothnie said this is changing rapidly.

There currently are about 125 installations of Model 204, which run on IBM OS systems. Larry R. DeBoever, director of marketing for CCA, explained that most of these sales were made in the last two years. "In 1980 there was one salesman. We sold Model 204 only from Cambridge," he said. Today, the firm has nine branch offices across the U.S. and seven international affiliates.

CCA also plans to offer a DOS and CMS version of Model 204 in 1983 to increase its penetration in the low-end IBM mainframe marketplace.

CCA in Growth Phase

CCA is in a growth phase, and Rothnie predicted the company will grow faster in 1983 than ever before. There are 183 employees currently and he anticipates increasing that number to 300 next year at this time.

The firm remains privately held, however, and Rothnie does not see any move toward going public in the near future. "There are a lot of problems with being a public company. You get focused very strongly on short-term results. Our game plan is a long-range game plan. It includes new products being developed for 1984-85. We don't want to turn that off and focus on this quarter's results. We don't need it right now to get cash, and I don't think it is worth the difficulties that it would bring us at this particular stage of development."

During its first 15 years, CCA was focused strongly on data base research projects under government sponsorship. Dr. Thomas M. Marill, the president of CCA, did the research that resulted in Model 204 as part of this. In 1976, Marill established a 15-year growth plan. "The original projection called for 75% annual growth in the commercial business and much slower growth in R&D." The transition year was 1981, when, for the first time, commercial product revenues exceeded revenues from sponsored research.

CCA is striving for a balance between the revenues from its R&D and commercial products divisions. At the present time, commercial products yield about 60% of the revenues and basic research accounts for the remaining 40%.

One of the newest areas for the firm, on the research side, is something DeBoever described as "applied research." CCA's Research and Systems Business Development Division is bidding for contracts on large-scale systems implementstions — basically, 100 man-year projects. He saw these efforts as a way of applying the work of CCA's Research and Systems Division directly and, at the same time, customizing Model 204 to very large data base projects.

An example is its work for General Dynamics Corp. to build a computer-aided design and manufacturing (CAD/CAM) system that will run on a complex of IBM 3081 CPUs. The system will be built on top of the Model 204 DBMS, which will include engineering data attributes. DeBoever said the project will bring $10 million in revenues for CCA if it is fully funded.

DeBoever compared CCA's research lab to Dr. Edgar Codd's research facility for IBM in San Jose, Calif., except that Codd's work "never filters to the commercial products group at IBM." CCA's goal is to bring the fruits of its research efforts to the commercial community. A step in this direction is the planned consolidation of the R&D and commercial products divisions in a new building in January 1983 in which both groups will be only a floor apart to facilitate communication.

Although many firms tend to keep quiet about the products they have on the drawing board, CCA has been describing its planned offerings for 1983 and 1984 during the past year. These include Multibase, a system intended to integrate preexisting data in a variety of data base management systems; and Adaplex, a distributed data base system written in Ada, the Department of Defense-sponsored language. Another of its planned announcements is View, a set of graphics interfaces to large production data base systems (see related story on Page 79).

Rothnie said the announcements are a deliberate strategy by CCA to make the public aware of its R&D capabilities.

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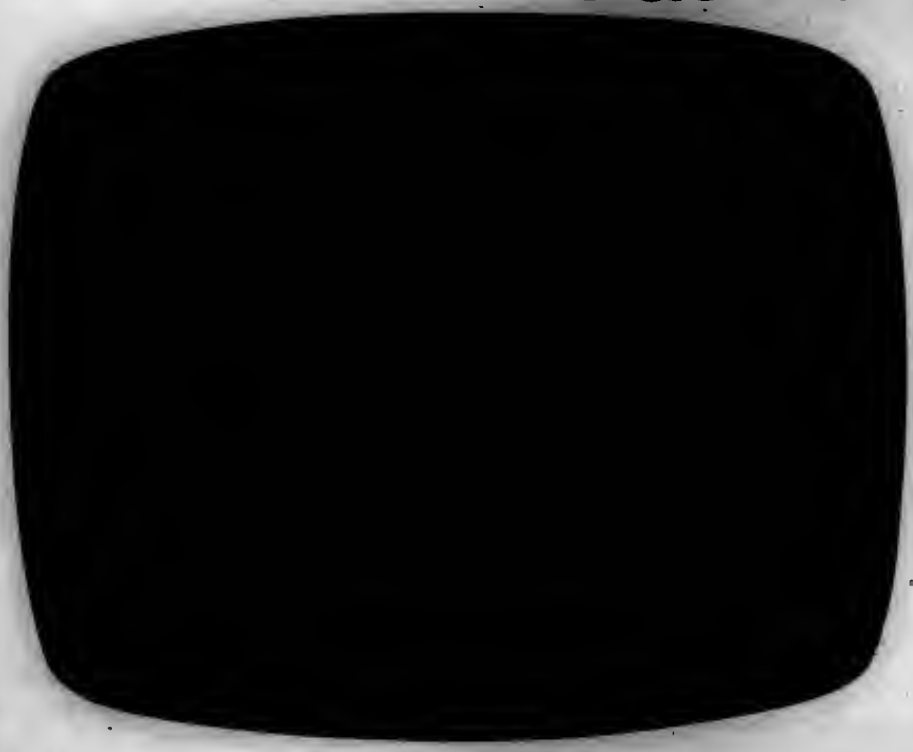

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Viewing a Data Base Through Graphics in Works at CCA

CAMBRIDGE, Mass. — The demonstration was held in the "Media Room," which was designed to be a "homey and comfortable" environment for software development and demonstrations of products at Computer Corp. of America's (CCA) Research and Systems Division.

The product was View, originally designed in 1977 as the Spatial Data Management System (SDMS) under a CCA contract with the Defense Advanced Research Projects Agency.

Basically, View is a set of graphics interfaces to large production data bases that was designed to allow end users to browse a data base by scrolling through symbols — such as pictures of ships for a Navy data base. Christopher F. Herot, director of man-machine interfaces at CCA, described it as a replacement for the person who is assigned to sit at the terminal and type in requests for information for the decision maker to use.

"It lets the decision maker access information directly," he explained, demonstrating the configuration of three color graphics monitors. "It is similar to the way you would find something on your desk," he said. The scenario he set is the manager who calls his secretary from somewhere on the road and asks him to find the note written in red ink on a yellow scrap of paper on the left corner of his desk. "These are skills people are good at, but have to leave behind when they walk up to the terminal."

Christopher F. Herot of CCA

In the three-screen configuration, the left screen contains a global representation of the data, such as a map with pictures representing different types of ships. The center screen is a magnified view of the same data. As the user employs a joystick to move the cursor around the left screen, the center screen shows the magnified view of the cursor's location. By twisting the joystick, the center-screen image zooms larger until it displays more information retrieved from the data base. In the demonstration of a Navy data base of ships, lines of information about the particular ships would appear under the graphical representation of the ship being magnified.

In July 1982, CCA installed a version of View on the *USS Carl Vinson*, a nuclear aircraft carrier. The data base is hooked up to a video disk so the users can scroll through screens of actual maps to see where ships are located. "When you twist the joystick on the *Carl Vinson*, it gives you a new map," Herot explained.

View currently runs on a Digital Equipment Corp. VAX-11/780. The *Carl Vinson* version is running on a DEC PDP-11/70.

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Prime Opens Software Center

NATICK, Mass. — Prime Computer, Inc. has announced the opening of a software conversion center designed to enable its resellers, software houses and multiple system customers to convert economically their software packages.

The facility, located in Pittsburgh, Pa., is staffed by Computer Support Services Co. (CSS), which is responsible for the day-to-day operations of the center.

Initially the center is providing Cobol conversion services by using CSS' Cobol Program Generator and Cobol-to-Cobol converter. Other software tools and services reportedly will be added as they become available, to permit those using other programming languages or other vendors' hardware to upgrade their applications software to Prime systems.

The center features a Prime 750 system in the central computer room, with three private conversion rooms equipped to handle up to a three-member conversion team.

To use the facility, users must enter into a agreement with CSS and pay a start-up fee, with actual conversion costs based on the overall size of the programs converted. More information is available from Prime Computer, Prime Park, Natick, Mass. 01760.

Competition for Distributors Keen

Vendors Seen Adopting New Marketing Plans

(Continued from Page 73)

Capro, Inc., product uniqueness will enable vendors to be "somewhat selective" in setting up a third-party distribution network. At Comdex Capro introduced a small business system based on the Pro-IV software package developed by Data Technical Analysts, Inc.

Lee claimed it is Capro's use of Pro-IV that, he said, "solves 90% of a user's business applications problems," which will give the company the leverage it needs to establish a competent distribution network.

Compared with a year ago, "It seems the smaller distributors are becoming more noticeable as demand for distribution networks has increased," he said.

Some Salesmen

Lee said a top distributor should be thoroughly versed in software technology to sell turnkey systems. However, there are some salesmen "who will claim they can sell end users anything, and these are the guys to watch out for," he added.

Tab Products Co., which markets its terminals and micros via a distribution network, is about to embark on a new distributor program designed to broaden its sales scope greatly.

According to Robert J. Stroh, director of marketing, the success of the program will be measured in its ability to recruit smaller distributors with broad market penetration but limited financial resources.

In essence, Tab will assume the shipping, inventory and financing burdens typically carried by distributors in order to reach the smaller end users.

"It's just too difficult to get into all the markets because there aren't enough big ones [distributors] out there," Stroh said.

At Televideo Systems, Inc., a $100-million-per-year terminal and systems manufacturer, company officials said product uniqueness and company viability are the keys to establishing an effective distribution network.

Richard A. DuBridge, executive vice-president at Televideo, said the top distributors "tend to flock around the companies with the hot systems."

DuBridge said the third-party distribution channels are "all in place in the industry," calling the rapid maturity of those channels "the perfect example of how capitalism is supposed to work."

And at Honeywell, Inc., William F. Boone Jr., marketing development manager, said one advantage of third-party selling to the end user, is that the end user "has a certain amount of leverage over the independent sales organization that he wouldn't have over a large systems house."

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[illegible]				
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8A625-AA	PDP8E Proc. Opt #2 120/60	6,450	2,570	60.1
8A625-AB	PDP8E Proc. Opt #2 240/50	6,450	2,570	60.1
VT278-GJ	Dutch DECmate W/Comm Option	3,900	2,000	48.7
DISKS				
RL01-A	Disk Drive (w/o Disk Pack)	3,000	2,000	33.3
[illegible]				
RM03-C	RM03 Dual Access Kit	2,150	500	76.7
RM80-C	RM80 Dual Access Kit	2,150	500	76.7
RP06-U	RP06 to RP08 Upgrade Kit	10,500	3,300	68.3
R80-AA	256KB Single Disk & Cont.	2,500	1,200	66.7
[illegible]				
TAPES				
TS03-SA	Slave 800 BPI Mag Tape Unit 120/60	3,000	3,700	28.
TU80-EB	Table Top TU80-Univ PWR W/EXR	1,750	650	63.9
TU58-VA	Dual Drive Mini-Cartridge Tape Drive	1,500	250	58.9
TU58-XC	Module W/Parallel Inf	400	200	50.
TU77-AJ	125 IPS NRZI, PE Magtape Drive 240/50	23,800	14,000	41.1
MEMORY				
MJ11-BE	640KW 11/70 Mem	19,500	6,000	69.2
MJ11-BM	32K x 18 Mem	4,900	2,500	48.9
MJ11-BY	64K x 18 Mem, Cont, PS	15,000	7,000	53.3
MK11-BE	64 KW MOS 11/70 Mem Exp.	17,200	1,700	90.1
ML11-AY	1 MB, Block Mode Mem, Cont, PS	20,000	9,000	55.
MM11-DP	16K Core Mem 11/04, 34	5,750	1,200	79.1
MM11-U	16K Box Mem Board Only	4,650	1,000	78.7
MM11-YP	32K Core Mem 11/04-34	6,300	1,750	72.2
MR78-BD	1K x 8 WP Rom 8 Mem	720	300	58.7
MRV11-AA	PROM/ROM Mem Unit	210	100	52.3
MRV11-BA	PROM Mem Unit	390	200	48.7
MS8-CB	32K x 12 Mem (4K RAM)	3,850	800	78.8
MS8-DJ	128K x 12 Mem (16K RAM)	6,420	500	92.2
MS11-FP	8K MOS Mem 11/04-34	1,750	200	88.3
MS11-JP	16K MOS Mem, 11/04, 34	3,450	250	92.7
MS11-KE	32KW MOS/ECC Array Card	6,096	760	87.5
MS11-LB	128KB MOS Mem, 11/24A, 11/24	1,180	1,000	15.9
MS11-LD	256KB Mem, 11/24A	1,700	1,250	26.4
MS11-MB	256KB ECC Mem	3,800	1,600	58.
MSV11-CD	16K MOS RAM Memory for 11/03	1,375	200	85.
MSV11-DA	4K x 16 84 MOS-RAM for LSI11	780	160	80.8
MSV11-DB	8K x 16 RAM Memory for LSI11	910	170	80.7
MSV11-ED	32K x 16 RAM Memory for LSI11	300	300	50.
COMMUNICATIONS				
DH11-AC	16 Chan ASYNC MPXR 240V	2,500	4,400	50.
DL11-W	DL11A-DL11D W/KW11-L	770	450	41.5
DM11-DB	4 Line EIA Adapter	1,790	1,000	44.1
DMC11-MA	Network Link 1MB Local LV	3,500	1,500	57.1
DMC11-MD	Network Link 56KB Local LV	2,500	1,500	40.
DUP11-DA	SYNC INTERF SDLC/DDCMP/BISYNC	1,375	1,000	28.6
DV11-AA	SYNC/ASYNC Multiplexer	6,570	2,400	38.5
DV11-BB	Line ASYNC Group	4,800	1,500	68.7
KL8-A	4 Chan ASYNC Cont.	1,300	390	70.
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LA12X-BL	LA180 Numeric Pad	90.	50	44.4
LA18X-BL	European Char Key Caps & ROM	140	50	64.2
LA36-CE	KSR Prntr + 20MA + Num Pad 60HZ	2,970	495	83.3
LA36-CJ	LA36-CE, 240V, 50HZ	2,970	495	83.2
LA36-HE	LA36-CE, 120V, 60HZ, EIA	3,080	495	83.9
LA36-HJ	LA36-CJ, 240V, 50HZ, EIA	3,080	495	83.9
LA180-PA	180 CPS R.O. Printer, Parallel 120/60	3,790	750	81.5
LAX34-KL	Key Pad—LA34/38	85	55	37.9
LAXX-KK	14 Key Pad/LA 35, 38	120	25	79.1
LAXX-LB	Opt. Mount Kit, LA35, 38	130	85	30.7

Part Number	Description	Regular Price	Sale Price	% Off
PRINTERS				
LAXX-NW	Buffered EIA Int, LA180	605	200	66.9
LP11-VA	132 Col Ptr, 20 Char 120/60	16,400	6,500	60.3
LP11-WA	230 LPM Printer 120/60	19,500	7,000	64.1
LQP8-ED	Ltr Card Printer PDP8 240/50	4,800	3,000	37.5
VIDEO				
VTXX-KA	VT52 Int. to LA36, LA180	260	100	61.5
VT100-WB	DKBD W/AVO & Word Proc. KBD 240	2,140	1,500	29.9
VT100-WC	VT100-AA W/AVO & Word Proc FR CDN 120V	2,140	1,500	29.9
VT100-WF	VT100-AB, AVO, WP & FR KYBD 240V	2,140	1,500	29.9
VT100-WH	VT100-AB, AVO, WP & Dutch KYBD 240V	2,140	1,500	29.9
VT100-WK	VT100-AB, AVO, WP & German kbd 240V	2,140	1,500	29.9
VT110-AA	VT100 W/DPM01 MOD Set 120V	6,325	2,500	60.4
VT110-AB	VT100 W/DPM01 MOD Set 240V	6,320	2,500	60.4
EXPANSION HARDWARE				
BA11-LE	5¼ In. 2 Sys Unit Exp 120V	2,700	1,700	37.
BA11-ME	3½ In. 4 Slot Exp. Box 120V	1,300	800	38.7
BB11-A	Bus Inf W/16 Unwired SL	294	150	48.9
BB11-B	Double Sys Unit-Bus Inf	415	200	51.8
MISCELLANEOUS				
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ATR16-00	Thermo Cple Temp. Ref Pan-16CH	531	300	43.5
DKC8-AA	PDP8A Opt BD #1	790	300	62.
DPM23-A	DPM (KDF11-AA, MSV11-DD, ISV11-B, BA11-NC)	10,370	3,000	71.
DR8-ED	Omnibus 2-Word Interface	478	200	58.1
DR11-L	2 Word Unibus Interface	514	250	51.3
DR11-M	2 Word Output Unibus	519	250	51.8
DR780-AA	DMA Channel, VAX 11/780 120V	16,700	6,500	64.5
DR780-AB	DMA Channel, VAX 11/780 240V	16,700	6,500	64.5
H978-AC	DECSTN Desk. 120V	670	350	47.7
IAC-IA	AC Sense—No Converters	350	250	28.5
IAC-IB	AC Interrupt—No Converters	370	250	32.4
IAC-OA	AC Driver-No Converters	380	275	28.4
IAD-OA	4 Channel D/A Conv	1,100	500	54.5
ICJ-IA	Jumper	25	22	12.
ICR11-AA	Remote File Box 120V/60	6,685	3,500	62.8
ICR11-AB	Remote File Box 240/50	6,685	2,500	62.8
ICS11-MA	ICS File Box For PDP11 120/60	3,846	1,500	60.9
IDC-IB	DC Interrupt—ISOL	390	200	48.7
IDC-IC	I/O Counter	310	175	43.6
IDC-ID	DC Sense—Non Isol	200	130	35.
IDC-IE	DC Interrupt—Non Isol	240	130	45.8
IDC-OB	DC Single-Shot Output	350	250	28.6
IRL-OA	Latching Relay Output	710	250	64.7
IRL-OB	Flip-Flop Relay Output	740	200	72.9
ISH-IA	Analog Shield	65	60	7.6
KC8-AA	8A Programmers Console	880	485	44.
KK8-A	Spare 8A CPU Board	1,190	300	48.8
KT8-AA	8A Mem Mgt (Fast Inst)	2,270	1,135	50.
MR11-EA	Config. Unibus Boot, ROM Pkg	1,050	250	76.1
VK170-CA	Video Kit, M7142	475	350	26.3

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Fortune Systems Named in Suit

LOS ANGELES — Fortune Systems Corp. has been slapped with a multimillion dollar suit alleging that the company infringed upon the U.S. trademark "Fortune 2000" and earned $10 million as a result.

The complaint, filed in U.S. District Court here by Multiplex Information Systems, charges that Fortune has infringed the trademark by using "the confusingly similar mark 'Fortune 32:16' on computer systems."

Multiplex manufactures the Fortune 2000 computer system.

Multiplex has additionally charged that Fortune has competed unfairly by "wrongfully appropriating [trademarks] in which Multiplex had developed good will."

The complaint asks injunctive relief forcing Fortune to cease using the mark "Fortune 32:16" or anything similar, treble damages of $3 million and Fortune's profits arising from its alleged wrongful actions.

Despite repeated telephone inquiries, Fortune declined to comment on the matter.

Micro Mart Seen Slowing by '90s

NORWALK, Conn. — The market for personal computers will taper off by the early '90s and eventually give way to an expanding market for multifunction workstations, according to a market study released here by International Resource Development, Inc.

Vendor Strategies for Personal Computers/Workstations predicts that sophisticated multifunction workstations, which combine data retrieval, word processing and personal computing functions, will eventually supplant personal computers as the primary growth market for low-end processors. The field of multifunction workstations will amount to $14 billion by 1992, the report predicts.

The report is priced at $985 from 30 High St., Norwalk, Conn. 06851.

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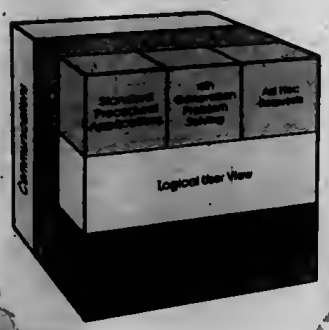

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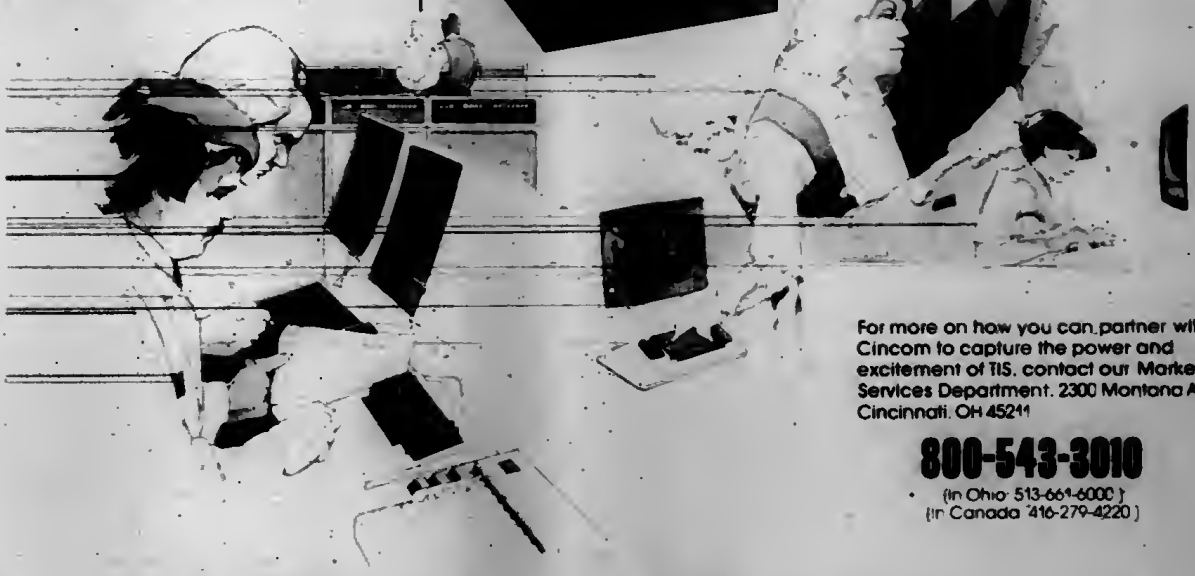

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Study Sees 26% Share by 1986

Growth Foreseen in Small System Disk Drives

WELLESLEY, Mass — The value of disk drives used in small systems — including small business computers, word processing systems and personal computers — will comprise 26% of small system shipments by 1986, up from 12% a year ago.

However, competition among increasing numbers of disk drive vendors will dampen market optimism for most manufacturers, according to a recent analysis by Venture Development Corp. here.

"The Hard Disk Industry II: A Strategic Analysis 1982-1986" examines the industry through a number of perspectives, including users, market participants and technological issues, the company said. The study also provides shipment information for disk drives used on mainframes, minis and small business computers.

According to the study, large system users are currently demanding larger capacity disk drives to store data files and programs for uses as data base management systems, communications capabilities, interactive graphics and decision support systems.

The paramount issue here, Venture claimed, is the lead time that IBM will have in selling G-byte capacity, thin film head drives.

On the other hand, the disk drive marketplace for small systems is characterized by the relatively large number of vendors, the newness of both systems and users and explosive growth, the study added. This market segment is not concerned so much with data capacity or technology but with total system price, reliability and backup options, the study said.

Venture contended that price battles, along with high-volume manufacturing capabilities in the low end, will leave strong market positions existing for few manufacturers.

Domestic manufacturers will also have to contend increasingly more with the Japanese in the low-end disk market, Venture added. The signing of U.S. distributors, a greater emphasis on exports and the presence of Japanese disk manufacturers bidding for key U.S. accounts all signal a more forceful Japanese intent in the domestic market, Venture said.

Further information about "The Hard Disk Industry II: A Strategic Analysis 1982-1986" is available from Venture Development Corp., 1 Washington St., Wellesley, Mass. 02181.

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IBM to Utilize Standard 52

ARMONK, N.Y. — IBM will implement the accounting standard on foreign currency translation (Financial Accounting Standard 52) in preparation of its fourth-quarter and full-year 1982 earning statements. IBM will also restate its 1981 earnings to reflect the new standard.

The standard requires selection of either the U.S. dollar or local currency as the "functional currency" for each of IBM's non-U.S. operations. Under Financial Accounting Standard 52, IBM's consolidated results will reflect both local currency and dollar-denominated functional currencies.

One immediate result of the accounting change was noted on Wall Street last week, where IBM's stock, one of the 30 listings comprising the Dow average and a Wall Street blue chip, broke 90 for the first time in nearly 10 years last week as the market overall pushed to record highs.

The stock closed last Monday at 92¾ following a week of steady gains after the announcement of the accounting change, which analysts felt would signal an increase in reported earnings. The change also fueled speculation that IBM would increase its dividend.

Desktop Sales To Rise: Report

MEDFIELD, Mass. — Driven by an increased demand for user-friendly business applications software, microprocessor-based desktop systems will command the dominant portion of the business and professional market by 1986.

This is a prediction from *Desktop Business Computers: Markets and Strategies, 1981-1986*, a recent report compiled by Advanced Resources Development, Inc. (ARD).

The study also indicated that while newly developed 16-bit computers accounted for only 10.7% of the business system market last year, the 16-, 16/32- and 32-bit processors will enjoy 68.1% of the this market by 1986.

ARD also expects that 32-bit microprocessors will be incorporated into desktop computers in the under-$20,000 price range as soon as 1984.

Copies of the 240-page report can be obtained for $1,295 from ARD at 28A Park Street Station, Medfield, Mass. 02052.

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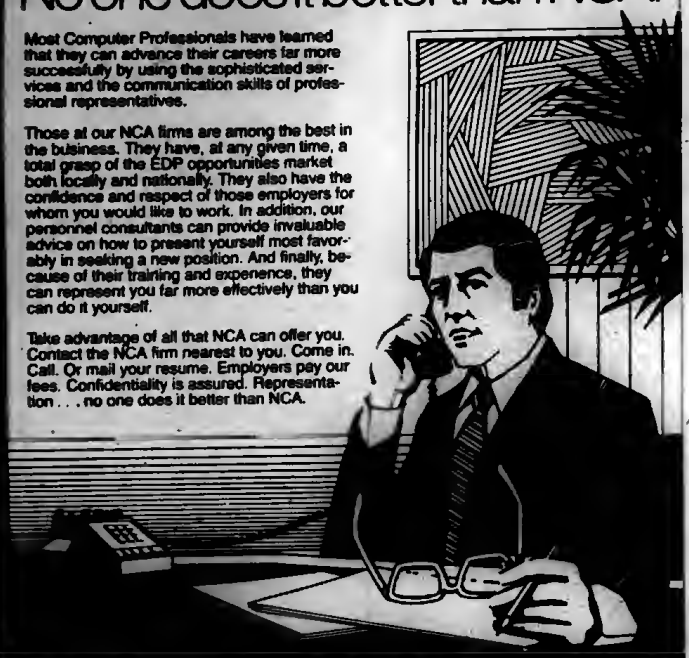

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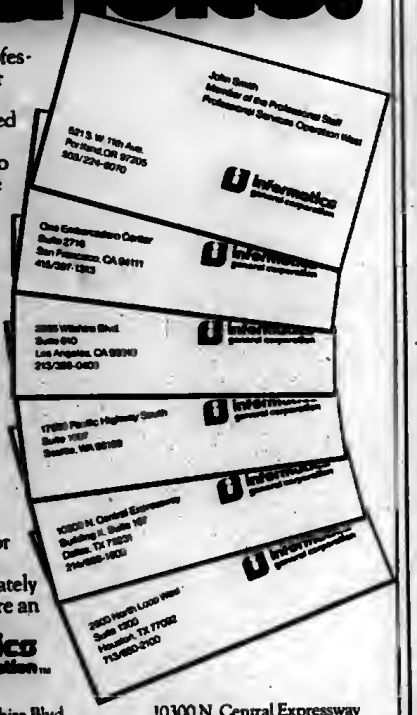

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Are you ready for a change or would you like to know what is available to you in career advancement? Our sis Data Processing Consultants know where the jobs are in the Southeast. Call or write now to find-out what opportunity awaits you. No cost or obligation to you.

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UNUSUAL OPPORTUNITY

DBD Systems, Inc., a worldwide leader in Data Base consulting and education offers this career opportunity to highly qualified professionals. Data Base design and Systems development experience utilizing ADABAS, IDMS, or IMS/VS is essential. Ability to communicate effectively, both verbally and in writing, is a definite plus.

Compensation will reflect experience, with exceptional benefits in addition. Please call COLLECT, (516)678-1447 OR send resume in confidence to:

DBD SYSTEMS, INC.
100 North Centre Ave.
Rockville Centre, NY 11570

WE'RE STILL GROWING LIKE WILD IN NEW YORK!

We're going strong, capturing a significant and ever-growing share of the computing services market from coast to coast with products like "MAS-M," an acknowledged superstar in the world of turnkey modular application systems that operate with VAX... and a massive remote computing capability that's penetrating market after market... plus turnkey systems for government and industry.

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—with at least 2 years experience with VAX, PDP 11/700 series... utilizing either VMS or RSTS/E Operating Systems with programming languages of BASIC PLUS 2 or VAX BASIC and a special emphasis on business applications and distribution and manufacturing.

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ADABAS

Experience must include 9 years in administration, 2 of which must be in the use of ADABAS. This person will be involved in a major development project.

IMS/DBDC

Our professional service division is seeking applications oriented DBA's to work with multiple users in functional design and development of IMS databases.

CICS

Must have 2 years of experience working in either MACRO or COMMAND level CICS.

All positions require substantial customer interface and the ability to deal effectively with management.

For immediate consideration, please rush your resume in strict confidence to Pat Sheckley, Martin Marietta Data Systems, 6305 Ivy Lane, Greenbelt, MD 20770.

MARTIN MARIETTA

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PRINCIPALS ONLY PLEASE

Computer Graphics Software Engineers

Tektronix, the established leader in the field of computer graphics, is seeking Software Engineers to participate in the design, development, and testing of new graphics products. These positions are located in suburban Portland, Oregon, an area long recognized for its "quality of life" lifestyle.

We are seeking candidates for the following positions:

Software Engineer Project Leader

Responsible to direct a team of software engineers working on new graphics/alphanumeric teller terminals. This will include participation in the development of:

- design specifications and functional specifications.
- design of new methodologies and tools for the development of software products.
- design of automated test programs for validating the performance of new products.
- developing evaluation plans.
- determining and scheduling resource needs.
- approval of products prior to engineering release.

This position requires a BS in Computer Science, Computer Engineering or Math with 5 or more years' software development experience.

Software Test Engineers

Responsible for designing evaluation test programs for the validation of firmware commands, designing and implementing automated design evaluation tools and participating in the development of design and functional specifications.

This position requires a BS in Computer Science, Computer Engineering or Math (Computer Science minor) and 2 years' high level language programming experience.

If you are qualified for either of these positions and would like further consideration, forward your resume and salary history to: Staffing Manager, Information Display Division, 63-658, Tektronix, Inc., P.O. Box 1000, AEF1, Wilsonville, OR 97070 or phone (503) 685-3261.

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Tektronix

Capacity Planning Specialist

Pacific Power and Light Company is the largest electric utility in the Northwest, and is currently looking for a qualified person to fill a Capacity Planning Specialist position in our Computer and Technical Services Department.

Position requires a degree in statistics or mathematics, and a minimum of 6 years' data processing experience. Must have extensive experience in MVS, working knowledge of IMS, and familiarity with mathematical modeling techniques and CICS.

We offer an excellent fringe benefits program and a highly competitive salary commensurate with experience. Qualified candidates should forward their resumes, including salary history, to: **Pacific Power and Light Company, Recruitment and Staffing, A-12-14-62, 920 SW 6th Avenue, Portland, OR 97204** or call **(503) 243-4357.**

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SYSTEMS ANALYSTS
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DATA BASE ANALYSTS

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As Data Security Officer, you'll be fully responsible for the planning, design, development and maintenance of bankwide data security systems. This will encompass on-line funds transfer and international banking systems in a state-of-the-art environment. You'll also perform risk analyses of the bank's computerized facilities and develop contingency plans to counter the effects of system unavailability.

At least 2 years professional programming experience on PDP-11 and IBM 4341 is essential, most preferably in a financial institution. Initiative, administrative ability and willingness to accept increasing responsibility are also important.

We offer an excellent salary and benefits package commensurate with experience, plus the opportunity for substantial career achievement in our progressive organization. Apply by sending resume with salary history, in confidence, to:

BOX CW634
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Republic National Bank of New York

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(215) 629-0595

RSVP SERVICES
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Programmer/Analyst

Oregon-based insurance company. 3-4 years COBOL experience; DOS/VSE desirable. Work with technical team installing insurance package on IBM 4331. Develop new programs/customize packages as needed. Prefer 1-2 yrs. insurance/finance experience. CDP/CCP desirable. CICS beneficial. $1375-1920/mo. + benefits. **Resumes and salary requirements to: Personnel Manager, P.O.Box 2209, Salem, OR 97308.**

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Well capitalized, $30 million software firm seeks senior executive to assume responsibility for all sales management and marketing activities. We market leading edge software products to IBM mainframe and p/c users. We are seeking a seasoned individual to manage our explosive growth. Considerable sales management experience and acumen required. Creativity, motivation, and understanding of the bottom line are musts.

Join a management team with a "winning" attitude and a string of successes. Enjoy exceptional individual compensation, along with the challenges of running a fast track sales organization. Realize your potential by sending a resume to:

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One World Trade Center, Suite 7967, New York, NY 10048, 212-524-0745
P.O. Box 232, Westwood, NJ 07675, 201-569-5366

EASTERN & SUNBELT LOCATIONS

PROGRAMMERS
SYSTEMS ANALYST
SOFTWARE ENGINEERS

Are you so busy doing your job that you've forgotten your career? In the rush of todays responsibility; many people are missing tomorrows opportunities. Invest a few minutes call PAM SPEARS CPC or send a confidential resume. You may find that you qualify for a position in an ideal location with even greater responsibility than you have now. All positions fee paid.

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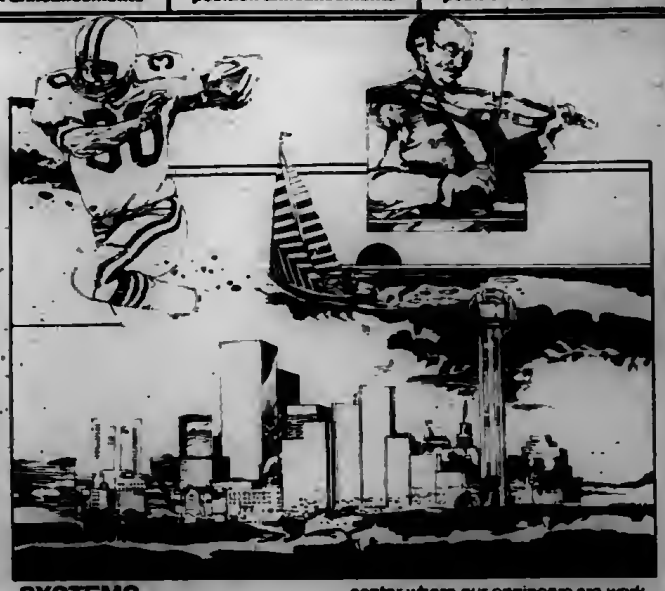

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Prefer experience with **TANDEM** computer systems.

Real-time, Software Design, Development and Testing:
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- Communications Software
- Operating Systems
- Data Base Applications
- Diagnostic Software

Must be experienced in assembly language programming:
- TAL
- MACRO-11
- PASCAL type assembly languages

Requires BS in EE or Computer Science with 3 or more years experience.

SOFTWARE TEST ENGINEERS

Must have experience in software systems testing which includes:
- Definition of software test requirements
- Generation of test plans/procedures
- Test execution and reporting

Extensive software development experience is not required, but you must have enough software experience to accomplish the above.

Prefer 2 to 4 years experience in Software Testing. BS in Computer Science or Math is required.

SYSTEMS PROGRAMMERS

Emphasis is on large-scale real-time distributed data aquisition/processing systems:
- VAX 11/780, PDP 11, Hewlett-Packard and Data General Mini-computers interconnected via the 50 megabyte HYPERchannel network system.
- Computer system interfaced to hardware devices via an ETHERNET NET-ONE systems for hardware control.
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- AYDIN color graphics terminals.

Prospective candidates should have as a minimum two or more years experience in VAX VMS systems internals. DBMS and networking experience is definitely a plus.

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WE UNDERSTAND: A SPECIAL MOVE REQUIRES SPECIAL CARE.

E-Systems goes beyond the norm to make the personal side of your relocation as ideal as the professional side. Throughout every phase of your move, we provide you with special relocation services—like dual career assistance to make your spouse's move as bright as yours. In fact, we do everything we can to keep your relocation as simple and problem free as possible.

We are currently accepting resumes. To receive our mini-information packet write to: **Gary Hunt, E-Systems, Inc., Garland Division, P.O. 226118, Dept. SE41, Dallas, Texas 75266.**

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Systems Programmer

Attractive career opportunity at Pfizer's Data Center for a software support specialist to install and maintain a TOPS-10 operating system in a SMP environment. Responsibilities will also include developing system software for DEC system-10, VAX and PDP-11 computers.

Background should include a BS/MS in computer science or EE and 1-5 years experience with TOPS-10 internals. Knowledge of computer networks, graphics, DBMS and scientific applications desirable.

This position offers a stimulating professional environment in an attractive Connecticut shore area, complemented by a competitive salary/benefits package (relocation assistance available). Qualified applicants may submit detailed resume in confidence to:

Mrs. Lorraine C. Corr, Pfizer Central Research, Eastern Point Road, Groton, CT 06340.

Pfizer

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Come discover an environment that's unique, where the climate is temperate and the technology challenging. Come to Martin Marietta Aerospace at Vandenberg for growth opportunities with an expanding company – in the still uncrowded, scenic central California coast.

We have a need for an individual to perform business system analysis and design of computer applications for integration with detailed computer systems. DOD/VS, COBOL, DL/I experience necessary. Must be able to assume full responsibility for projects and direct junior programmers. Will be working on IBM 4341 with CICS, DMS, VSAM and ICCF. BS degree or equivalent applicable experience required.

We offer a salary commensurate with experience and an excellent benefits package. For immediate consideration, please send resume to: **Ms. Shirley Whitcomb, Dept. CW1282, Martin Marietta Aerospace, P.O. Box 1681, Vandenberg AFB, CA 93437.**

MARTIN MARIETTA

Proof of U.S. Citizenship Required
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VICE PRESIDENT
MANAGEMENT INFORMATION SERVICES

Wendy's International, Inc. is a NYSE listed multinational corporation which is recognized as one of the leaders in the food service industry with over 2400 worldwide units and more than $1.5 billion in system-wide sales. Keeping pace with our rapid growth are our IBM computers and DP facilities which rank among the most advanced in private industry. In order to maintain our high level of performance, we are seeking a polished EDP professional to fill the position of Vice President, Management Information Services to be based at our Corporate Headquarters in suburban Columbus, Ohio.

Reporting to the Chief Financial Officer, responsibilities of this position include overall direction of the data processing activities including computer operations, technical support, point-of-sale, and systems and programming. Administrative responsibilities include preparation of departmental multi-million dollar budget, directing departmental staffing effort and development of short and long range planning.

The ideal candidate will have 8-10 years senior level experience in a large scale management information operation, preferably retail oriented. This experience should include extensive work in hardware/software enhancements and procurement, development and implementation of point-of-sale systems, management and continuing development of a staff of project leaders and programmers, and a record of success in maintaining a state-of-the-art operation. Must possess superior interpersonal and communications skills and a record of proven effectiveness with department staff, members of senior management, and outside vendors. A BS Degree is required with an MBA a plus.

This challenging opportunity will be rewarded with an excellent compensation package to include bonus, a company car, comprehensive benefits package and generous relocation plan. Please respond with resume and salary history to: Howard Roof, Supervisor of Employment.

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In this position, you would be capitalizing on your minimum 2 years' experience in programming, systems analysis and/or EDP auditing in either a public accounting or manufacturing environment. You should be knowledgeable in COBOL, FORTRAN, MARK IV and have worked with IBM 370 hardware/software and IMS data base systems, also HP-3000 hardware/software and Image data base systems. Typical responsibilities:

- Performing audits of large, complex computer systems
- Developing analyses of design control characteristics and procedures
- Testing integrity of processing and reliability of controls through sophisticated computer audit techniques
- Enjoy limited travel (10-15%)

Excellent advancement potential within various accounting units or Management Systems Department. You'll appreciate the highly professional working atmosphere, excellent salary and generous benefits. Our relocation package for new hires who are homeowners includes a mortgage interest differential allowance, third party home purchase option, and other features often restricted to internal transfers. Act NOW! Participate in SOHIO's massive plans for energy development through the 80's and beyond. Send your resume and current salary in complete confidence to:

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SOHIO

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Harris Government Systems Sector, a communications systems designer for a variety of government applications, with over $500 million in sales, 7,000 employees and a strong growth record, seeks talented MIS personnel. Experience is sought in the development of on-line data base systems for finance/accounting, manufacturing and material management applications. Technical expertise in ANS COBOL, MVS JCL, IDMS and IDMS/DC beneficial, and experience with high-level languages such as FOCUS and IDMS ADS/on-line helpful. Need ability to interface effectively with users and experience in a project-team environment.

Experience desired: 3 or more years in a large-scale business software development environment. Bachelor's degree in computer science or accounting. U.S. Citizenship required.

We are a division of the Harris Corporation, Florida's largest industrial employer, located in a Florida east coast resort area, where you will earn nationally competitive income and excellent benefits, while paying no state or local income taxes—and enjoy the lower cost of Florida living.

For consideration, please forward your resume in confidence to: Julian Kaufmann, Harris Government Systems Sector, P.O. Box 37, Melbourne, Florida 32901. Or call COLLECT 305-727-4232.

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DATA PROCESSING CAREERS INC

SYSTEMS ANALYSTS AND PROGRAMMERS FOR SUNBELT LOCATIONS

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Send an SF 171 to: Wm. T. Detering, Dept. of Justice, Justice Management Division, Justice Computer Service, Rm. 4609, 425 I Street N.W., Washington DC 20530. An EOE.

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Design and develop new computer programs for use in major department stores. Maintain present system. Use COBOL and Assemble language. Apply knowledge of IBM DOS/VSE and WESTI online procedures. Forty hour/week; $25,000/year; Master's in Computer Science; One year experience. Send resume to Sakowitz, Inc., 1111 Main St., Houston, TX 77002. Attention: Jeanne Bridgman

SYSTEMS PROGRAMMER

3 - 5 years. Systems/Programmer experience with knowledge of large IBM main frame utilizing OS/MVS, VM/CMS and CICS internals. Salary starts upper $20's plus benefits. Send confidential resume with salary history to:

New York State
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Albany, NY 12207
Att.: Dir. of Personnel/Finance

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SYSTEMS ANALYSTS

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For further information, call or send resume to:

Dave Swanda

H.L. YOH COMPANY

6300 Carmel Road
Charlotte, N.C. 28211
(704) 542-6200

SYSTEMS PROGRAMMER

Southwest Metropolitan 1100+ bed medical center complex is seeking a Systems Programmer for a four hospital system. Requires minimum of three years experience in systems in an MVS shop. Must know CICS, ACS/NCP and be able to use SMP. OS/VS experience required. For immediate consideration, send confidential information to:

Employment Manager
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We currently have a position available for an experienced **Senior Project Manager** who has outstanding technical depth and has the following skills: You should be knowledgeable in and familiar with the state-of-the-art in mainframes, mini and micro computers and be conversant with the state-of-the-future. Your scope of applications should include all major business systems; their design, conceptualization and implementation. You should be comfortable with both government and commercial clients and be experienced in managing the staff and budget of a major systems project.

In this senior management position a great deal is demanded of you...but the personal and professional rewards are limitless.

To explore this opportunity further, please send your resume including salary requirements, in confidence, to Ms. Sharon Blackmon, Booz·Allen & Hamilton, MISD, 4330 East West Highway, Bethesda, MD 20814.

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ADJUNCT COMPUTER FACULTY

SEQUOIA Computer Academy needs COBOL, OSJCL, BAL, Computer Fundamentals and Systems Analyses Instructors for a new professional training course in New York City. Courses begin in March 1983. Applicants should have recent related experience in commercial data processing. A degree is required; advanced degree desirable. The environment is IBM 4341 with VM and OS/VS1.

SEQUOIA provides top quality training through an excellent facility, solid curricula and quality faculty and students.

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Computer Academy
International Computers & Communications Systems, Inc.
Suite # 2238 60 East 42nd Street
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Get involved on the ground level of a large hospital information system. On line systems developed using PCS, DL/1, CICS in a VM/VSE environment. Hardware is IBM 4341-II and 370/158.

Minimum 3-5 years experience preferably in a medical facility. 500 bed fully accredited hospital/clinic located in Central Texas. Excellent benefit package along with outstanding opportunity for a permanent career.

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Along with top growth potential and professional satisfaction, CTI offers a highly attractive salary and liberal benefits. Additionally, our location in Raleigh affords easy access to both mountains and beaches for year-round recreational activities and is known for its cultural sophistication and reasonable living costs.

For prompt, confidential consideration, please forward resume with salary history and requirements to:

Director-Software Engineering
CUSTOM TERMINALS, INC.
5275 North Boulevard
Raleigh, N.C. 27604

CTI

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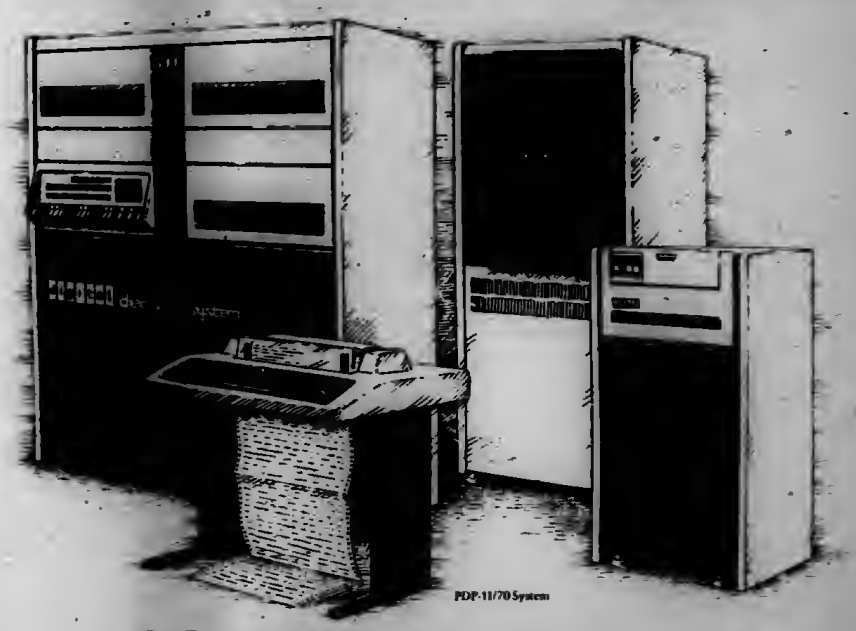

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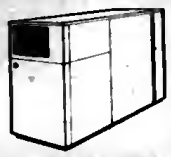

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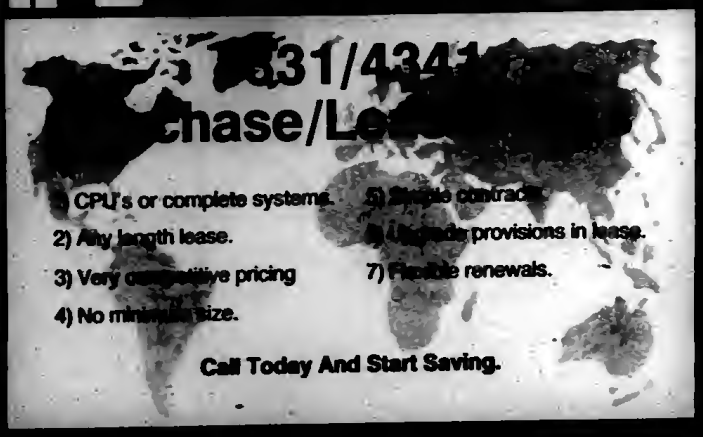

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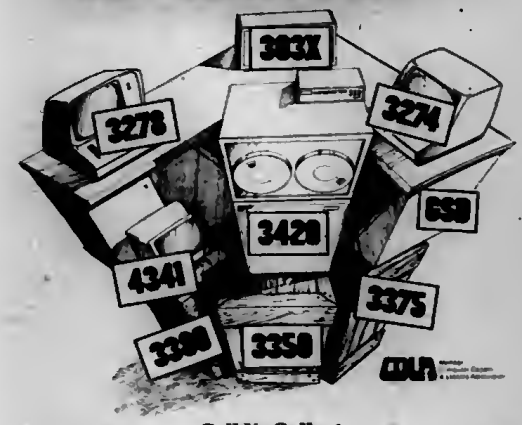

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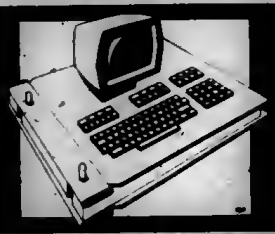

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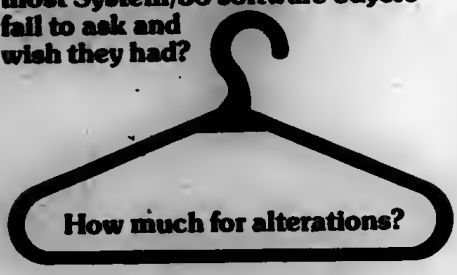

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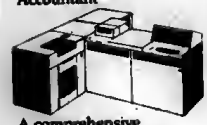

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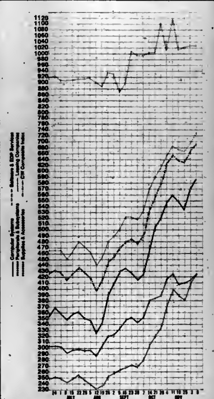

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EXCH		1981-82 RANGE (1)	CLOSE DEC 8 1982	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	17- 38	31 3/8	-1	-3.0
N	BURROUGHS CORP	28- 48	43 1/2	-1 1/8	-2.8
N	COMPUTER AUTOMATION	7- 17	10 7/8	+1 1/4	+8.8
N	CONTROL DATA CORP	21- 42	[illegible]	[illegible]	[illegible]
N	CRAY RESEARCH INC	20- 49	44 7/8	+6 5/8	+17.3
N	DATA GENERAL CORP	20- 58	48 3/4	+1 1/2	+3.8
N	DATAPOINT CORP	11- 34	20 1/4	- 3/4	-3.5
N	DIGITAL EQUIPMENT	62-113	108	+6 1/4	+6.0
O	ECCO INC	8- 11	19	+ 3/8	+3.8
N	ELECTRONIC ASSOC.	9- 12	11 1/2	+ 1/4	+2.2
N	FLOATING POINT SYST	16- 30	30	+6 1/4	+26.3
N	FOXBORO	22- 38	34 3/4	+1	+3.0
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 8	6	- 5/8	-9.4
N	HARRIS CORP	20- 43	37 5/8	+1 1/8	+3.0
N	HEWLETT PACKARD CO	38- 82	78	+5 3/8	+7.3
N	HONEYWELL INC	58-104	94 3/4	+3 3/8	+3.3
N	IBM	48- 95	94 1/2	+8	+9.2
D	IPL SYSTEMS INC	3- 8	8	+ 1/4	+3.2
D	MAGNUSON COMP SYSTS	2- 10	3	- 1/2	-14.2
N	MANAGEMENT ASSIST	7- 18	12 1/2	+ 7/8	+7.5
D	MICRO-COMPUTER SYST	3- 4	1/2	+ 1/8	+33.3
N	MODULAR COMPUTER SYS	8- 13	12 3/4	+1	+8.5
N	MOHAWK DATA SCI	10- 18	18	0	0.0
N	NCR	39- 89	83 1/8	+2 7/8	+3.1
N	PERKIN-ELMER	17- 32	30	- 1/8	-0.4
N	PRIME COMPUTER INC	18- 38	37 1/8	+ 3/8	+1.0
N	SPERRY CORP	31- 37	38 3/4	+1 3/8	+4.7
O	TANDEM COMPUTERS INC	14- 34	23 3/4	-7 3/4	-28.0
N	TEXAS INSTRUMENTS	71-151	146	+8 1/8	+6.4
A	WANG LABS "B"	25- 83	82 1/2	+4 1/2	+7.7
A	WANG LABS "C"	21- 81	80 1/4	+2	+3.4
	LEASING COMPANIES				
N	BOOTHE FINANCIAL CP	22- 28	26 1/4	- 1/4	-0.4
N	COMDISCO INC	13- 35	34 1/2	+3 1/4	+10.3
S	COMMERCE GROUP CORP	7- 1	3/8	0	0.0
O	COMPUTER INVSTRS GRP	1- 2	3/8	0	0.0
O	CONTINENTAL INFO SYS	5- 20	17 3/4	-1 1/8	-6.5
N	DPF INC	5- 13	8 3/8	- 3/8	-4.2
O	ITEL	1- 3	7/8	0	0.0
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 37	37 1/4	+ 1/2	+1.3

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	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 8	1 7/8	0	0.0
O	ADVANCED SYSTEMS INC	5- 18	18 1/2	+2 1/4	+13.8
O	AGS COMPUTERS INC	7- 17	17 1/4	+3 3/4	+27.7
N	ANACOMP INC	9- 17	18 3/8	+ 3/4	+4.8
O	ANALYSTS INTL CORP	5- 8	8 1/8	+1 3/4	+28.0
A	APPLIED DATA RES.	18- 42	42	- 1/8	-0.2
O	ASA COMPUTER SYSTEMS	12- 27	26 3/8	+2 1/8	+8.7
O	[illegible] COMP IND	1- 3	2	0	0.0
N	AUTOMATIC DATA PROC	21- 37	37	+ 1/2	+1.3
O	CGA COMPUTER ASSOC	5- 8	8 1/4	- 1/2	-5.7
O	COMPUTER ASSOC INT'L	12- 38	37 1/2	0	0.0
O	COMPUTER HORIZONS	1- 3	7	+1 3/4	+33.3
O	COMPUTER NETWORK	4- 8	8 7/8	+1 5/8	+22.4
N	COMPUTER SCIENCES	11- 20	20 1/8	+1 3/8	+7.3
O	COMPUTER TASK GROUP	8- 18	18 3/4	- 3/4	-4.3
O	COMPUTER USAGE	2- 5	3 1/2	- 1/4	-6.6
O	COMPUTONE SYSTEMS	13- 30	29 3/4	+4 3/8	+17.2
N	COMSERV CORP	11- 20	17 1/4	-1 1/2	-8.0
O	[illegible]	8- 18	9 3/4	-1 1/4	-17.8
O	CULLINANE DATABASE	24- 53	40 1/2	-3 1/4	-4.3
O	CYCARE SYSTEMS INC	8- 18	18 3/4	- 1/2	-3.8
O	DATA DIMENSIONS INC	1- 2	1/4	0	0.0
O	DATASTAR	1- 4	3/4	0	0.0
O	DYATRON CORP	2- 8	9	+ 1/2	+20.0
N	ELECTRONIC DATA SYST	18- 56	46 3/4	- 3/8	-1.5
N	INFORMATICS INC	10- 24	22 1/2	+1 1/8	+5.2
O	INSYTE CORP	1- 3	1 5/8	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1 1/4	0	0.0
O	KEANE ASSOCIATES	4- 9	3 1/4	+ 1/2	+10.0
N	LOGICON	12- 28	28 3/8	+1 7/8	+7.0
O	MGMT SCI AMER INC	10- 42	41 1/4	- 1/2	-1.1
O	MATHEMATICA INC	12- 18	18 1/2	+2 1/2	+17.0
O	MATHEMATICAL APP GRP	12- 18	14 1/2	+1	+7.4
O	NATIONAL DATA CORP	13- 28	28 1/2	+4 1/8	+20.0
O	PANSOPHIC SYSTEMS	8- 20	18 1/4	+ 1/8	+1.3
N	PLANNING RESEARCH	8- 11	11	+1 1/8	+11.3
O	PROGRAMMING & SYS	1- 2	2 1/8	0	0.0
N	REYNOLDS & REYNOLDS	17- 27	26 3/4	+ 1/2	+1.8
O	SEI CORP	21- 48	48	+1	+3.3
N	SHARED MEDICAL SYST	28- 53	53 1/8	+ 7/8	+1.8
O	SCIENTIFIC COMPUTERS	8- 13	13	+1 1/2	+13.0
O	SOFTWARE AG	5- 17	13 3/4	+2 1/8	+18.3
N	TYMSHARE INC	12- 30	22	-2 3/8	-8.3
A	URS CORP	10- 19	14 5/8	+1 3/8	+10.3
N	WYLY CORP	7- 13	10 1/4	- 7/8	-3.8
	PERIPHERALS & SUBSYSTEMS				
N	AM INTERNATIONAL	1- 13	3 1/2	+	+3.6
O	ANDERSEN JACOBSON	8- 28	29 3/4	+ 3/4	+3.0
O	AUTO-TROL TECHNOLOGY	8- 19	17 1/8	-1 1/2	-8.0
O	BANCTEC INC	7- 33	14 3/4	+ 1/4	+1.7
O	BEEHIVE INT'L	4- 8	7 3/8	+ 1/4	+3.5
A	BOLT,BERANEK & NEW	8- 38	38 3/8	+2 1/8	+6.0
O	CAMBEX CORP	2- 4	3 3/8	- 1/2	-17.3
A	CENTRONICS DATA COMP	8- 17	18	+1 1/4	+8.0
O	CETEC CORP	6- 8	8	- 1/4	-4.0
O	COGNITRONICS	6- 8	8 3/8	+ 1/4	+3.0
D	COMPUTER COMMUN.	1- 2	3/4	0	0.0

EXCH		1981-82 RANGE (1)	CLOSE DEC 8 1982	WEEK NET CHNGE	WEEK PCT CHNGE
A	COMPUTER CONSOLES	15- 28	[illegible]	[illegible]	[illegible]
N	COMPUTER DEVICES INC	4- 27	14 3/8	- 3/4	-4.8
O	COMPUTER TRANSCEIVER	4- 7	7	+ 3/8	+5.0
N	COMPUTERVISION CORP	18- 38	[illegible]	-3 1/2	[illegible]
N	CONRAC CORP	21- 36	34 3/8	- 3/8	-1.7
O	DATA ACCESS SYSTEMS	2- 9	1 3/8	0	0.0
O	DATAPRODUCTS CORP	10- 39	34	+1 3/4	+5.4
A	DATARAM CORP	3- 14	10 1/8	+1 1/4	+14.0
O	DATUM INC	2- 5	4 1/2	+ 3/8	+10.1
O	DAVID JAMISON CARLYL	5- 7	4 3/8	- 3/8	-7.9
O	DECISION DATA COMPUT	3- 14	14	+ 3/4	+5.6
O	DELTA DATA SYSTEMS	1- 3	3 1/8	+ 7/8	+36.0
N	ELECTRONIC M & M	5- 8	7 1/8	+1	+16.3
O	EVANS & SUTHERLAND	18- 46	46	+6	+14.2
O	GANDALF TECHNOLOGIES	10- 22	18 1/2	+2 3/8	+14.2
N	GEN'L DATA COMM IND	6- 30	18 1/8	+1 3/8	+8.2
O	GENERAL TERMINAL CP	4- 4	1/2	0	0.0
O	GREAT SOUTHWEST IND	2- 9	2 1/2	- 1/4	-9.0
N	HAZELTINE CORP	22- 40	42 3/4	+3 1/8	+8.2
O	ICOT CORP	3- 8	8 1/4	+ 7/8	+11.2
O	INFORMATION INTL INC	10- 22	24 1/2	+3 1/4	+17.8
O	INTEL CORP	21- 46	38	+ 3/4	+1.0
O	IPL SYSTEMS INC	7- 8	8	+ 1/4	+3.2
O	LUNDY ELECTRONICS	7- 14	13 3/4	+ 7/8	+6.8
O	MSI DATA CORP	10- 28	28 1/2	-1 1/8	-4.2
O	NETWORK SYSTEMS CORP	19- 38	38	+1 5/8	+4.4
O	OMEX	3- 8	3	0	0.0
N	PARADYNE CORP	24- 58	47	-2 1/8	-4.3
A	PENRIL CORP	7- 12	10 1/2	+ 1/2	+5.0
O	QANTEX CORP	12- 20	1? 1/2	0	0.0
N	RECOGNITION EQUIP	4- 10	8 1/2	+ 1/2	+5.5
O	SCAN DATA	1- 5	1 1/2	+ 1/4	+20.0
N	STORAGE TECHNOLOGY	18- 40	23 1/4	-1 3/4	-7.0
O	[illegible]	8- 34	32 1/8	+2 1/4	+22.7
N	T BAR INC	7- 14	8 1/2	- 5/8	-6.8
A	TEC INC	4- 12	11 1/2	+2 1/8	+22.8
N	TEKTRONIX INC	34- 81	81	+5 3/4	+10.4
N	TELEX	3- 27	25 3/4	+2 3/8	+10.1
O	TESDATA SYSTEMS CP	3- 10	7	- 3/8	-5.5
A	TIMEPLEX INC	7- 18	17 3/8	+2	+13.0
O	VISUAL TECHNOLOGY	8- 17	15 3/4	[illegible]	[illegible]
O	WILTEK INC	1- 3	1 3/4	+ 1/8	+3.6
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	11- 18	17 1/4	- 1/4	-1.8
O	BALTIMORE BUS FORMS	1- 2	1 1/4	0	0.0
N	BARRY WRIGHT	13- 22	22 1/8	+ 3/8	+8.1
O	CYBERMATICS INC	1- 1	7/8	0	0.0
A	DUPLEX PRODUCTS INC	13- 20	18 3/4	+ 1/4	+1.3
N	ENNIS BUS. FORMS	18- 30	30 1/8	+ 7/8	+2.8
N	3M COMPANY	49- 78	74	+1	+1.3
N	MOORE CORP LTD	28- 41	46 1/2	+1 1/2	+3.0
N	NASHUA CORP	8- 18	12 3/8	- 1/8	-1.0
O	STANDARD REGISTER	32- 72	71 1/2	+2 1/2	+3.5
A	TAB PRODUCTS CO	13- 24	23 3/4	+3 1/8	+13.1
N	WALLACE BUS FORMS	22- 34	48	- 1/4	-0.5

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